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A COMPREHENSIVE REVISION OF THE LOGISTICS PLANNING EXERCISE (LOG-PLAN-X)

John F. Harris, Jr., Capt., USAF
Ronald L. Nickelson, 1Lt., USAF

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JUN 1981

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Wayne D. Kirk, Lt Col, USAF

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The purpose of this thesis was to substantially revise the LOG-PLAN-X Logistical Simulation. Current educators and the original designer had expressed the need for an updated version for academic use. By providing a current and relevant logistical simulation for academic use, the authors believe this research endeavor will aid in fulfilling a continuing need in realistic logistical education.

This thesis, written by

Captain John F. Harris, Jr.

and

First Lieutenant Ronald L. Nickelson

has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

Date: 17 June 1981

Wayne D. Kirk

COMMITTEE CHAIRMAN

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A COMPREHENSIVE REVISION OF THE LOGISTICS PLANNING EXERCISE (LOG-PLAN-X)

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Acquisition Logistics

By

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Finally, I, Captain Harris, would like to thank my wife and my children, who deserve much more than a mere thanks. Their endless encouragement, patience and understanding gave me the inward strength to endure the many ordeals.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Background

The origins of military operational and logistical simulations (also known as "wargaming") lie far in the past. At one time, such abstract simulations as chess were thought suitable training for "the real thing." The evolution of war simulations received a quantum boost from a Prussian, Herr von Reisswitz, and his son early in the 19th century. Reisswitz developed a war simulation which was unparalleled in realistic portrayals of military operations at that time. The younger Reisswitz, a first lieutenant in the Prussian Army in 1824, improved his father's game markedly. Thereafter, it was enthusiastically embraced by the Prussian Chief of Staff, von Muefflins, who is quoted as saying, "It's not a game at all, it's a training for war; I shall recommend it most emphatically to the whole army [2:45]." (Eventually, though, jealousy and harassment by fellow officers drove Reisswitz to suicide--not, we hope, an occupational hazard!)

Modern war simulations can be classified as either civilian or military in character; the most important distinction is purpose. Campion states,

> While the civilian wargame is designed for entertainment and for historical interpretation, the military wargame is intended for training and for predicting possible real futures [3:5].

Brewer and Shubik further classify the nature of military simulations as either operations, teaching and training, or experimentation (2:13) (see Fig. 1). Currently all branches of service utilize war simulations, particularly in school (professional military education) environments.

Why Simulate?

Simulations provide players with a means to evaluate their abilities to perceive problems and devise alternative courses of action, without suffering the risks/consequences inherent in the "real-world" environment. Although it is possible to view simulations as an end in themselves (i.e., to teach managers "how to simulate"), a primary value lies in their usage as a tool in solving problems. Problem solving through simulation helps participants gain experience which, otherwise, might be unattainable due to time, money, or technical constraints. Trial and error systems in real life can be very costly. Simulations can be an efficient and effective alternative to such trial and error methods by allowing the players' abilities and knowledge to be pretested. Simulations are, in short, a laboratory-type environment where players are stimulated to greater understanding of the area or circumstance(s) under study by being placed in a cogent and competitive situation. Valuable insights can also be realized when one can examine one's conduct within the context of a problem-solving group.

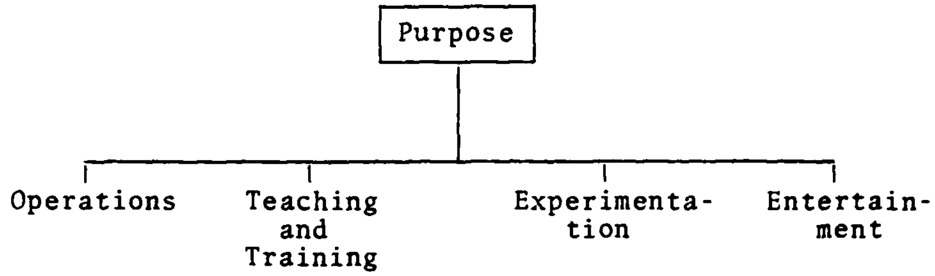

Figure 1. The Primary Purposes of Models, Simulations, and Games [2:13]

Nature of Simulations

Initially, one must realize that the true worth of simulations lies in their value as teaching vehicles or techniques only to the extent they contribute to the accomplishment of particular teaching objectives. The difference between conventional teaching methods and simulation rests in the fact that most conventional techniques focus on defining and explaining variables or situations within a given area. Simulation, on the other hand, provides participants with a technique for self-discovery of variables and their interrelationships (4:2). In effect, rather than merely studying management decisions, the student is allowed to "do" them. Nothing else short of real world experiences allows one to so consider a total management situation with its attendant variables, interactions, and relationships.

Problem Statement

A continuing need exists in the Air Force for highly trained and motivated logisticians. Logisticians are tasked with planning, programming, and managing certain cross functional aspects of logistics. These functional aspects include, but are not limited to, the acquisition, distribution, maintenance, and disposition of material, plus movement of personnel (14:A2-5[18]). To the extent that logistical simulations contribute to greater knowledge in these areas, use of current and relevant simulations is desireable in academic environments such as the Air Force Institute of Technology (AFIT), Squadron Officer School (SOS), and various technical training courses.

Justification

The ability to mobilize and deploy our military forces efficiently and effectively is a major objective of top-level military managers. Mobility/deployment involves the total synchronization and cooperation of all major logistical support elements within a base. Although mobility planners and managers receive training on the theoretical aspects of mobility/deployment, budgetary constraints frequently limit realistic "hands-on" experiences. By providing a current and relevant logistical simulation for academic use, the authors believe this research endeavor will help fill a continuing need in logistical training.

Literature Review

A simulation is a representation or abstraction that the players may experience in real life (4:10). As such, the primary purpose of a simulation should be directed to the fulfillment of some teaching objective (4:10; 8:2). In attempting to cover all areas pertinent to the problem of design of a logistical simulation, the literature review covered four major areas:

1. Simulation theory in general
2. Theory of logistical simulation
3. Survey of military logistical simulations currently available
4. Computer-assisted versus manual simulations.

In the area of simulation theory in general, most sources dealt with comprehensive aspects of business management. However, these business management simulations have certain basic, though possibly contradictory, tenets common to most all simulations. Games must:

--Have an objective

--Be playable (simplicity)

--Be realistic [4:10].

Although many sources make a distinction between the terms--"models," "gaming," and "simulation" (11:2;10:12; 12; 2:3), we will use the terms interchangeably here.

> By far the most important step in game design is the determination of the teaching objective. This is the step which dictates the progress through the other steps.
>
> What is the purpose of the game? Is it to teach

> the interrelationships and inter-dependencies of the various functional areas of logistics--transportation, warehousing, purchasing, production, maintenance, budgeting, cost-control? Or is it designed to teach a specific function in logistics--such as warehousing and distribution [10:2]?

Other sources emphasize the importance of 1) stability of the environment, 2) observation and measurement of participants' decision responses, and 3) minimization of the opportunities for the use of unrealistic tactics (11:7; 1:484).

The teaching objectives noted earlier are the determinants of variables to be included or specifically excluded. Normally there exists a continual trade-off between relevance to the concept(s) being taught and the contribution a factor makes to realism (4:10).

Playability and realism are often mutually exclusive terms. "The game itself should be designed as simple (playable) as possible consistent with achieving the desired objectives [4:11]." The number of concepts to be taught usually determines the level of simplicity or abstraction; it is important to bear in mind the level of abstraction to be utilized (6:249).

The level of realism the simulation assumes (or is perceived to assume) helps sustain player interest and commitment. Realism lends credibility. But how much realism/complexity should be incorporated in a simulation at the expense of playability? Ultimately, the simulation's objectives will be the prime determinant of the degree of realism (4:13). Other constraints, such as available class time, will also serve to limit the level of realism/complexity.

By its very nature, any logistical simulation should direct the players to maximize some function while minimizing some other function. In a business environment, the player is usually attempting to maximize profits while minimizing costs, such as transportation. In a military logistical simulation, the concept is modified slightly. The "profit" to be maximized is usually certain "levels of support;" "costs" are often in terms of dollars, but can also be quantified as a "level of support" which has been foregone elsewhere. It is here Carlson and Misshauk set forth their "teeter-totter" principle. That is, each decision made by the players should have offsetting effects (4:11). For example, increasing the stockage level of a particular end item will result in more dollars "tied up in inventory;" this can also cause a short supply condition elsewhere--which should not be taken lightly. Although an out-of-stock condition can cause lost profits in a business, a similar situation in a military environment can be devastating. In light of today's austere budget conditions, a primary purpose of a military logistical simulation may be "to train individuals in the importance of applying economic concepts of price to logistics decisions [13:146]."

According to Walther, at least 152 "official" war simulations currently exist (16). Typical logistically oriented simulations noted in this book include MISSLOGS and BASELOGS. The former, designed by the Rand Corporation, attempts to determine the logistical support systems required to support an intercontinental ballistic missile system. The

latter, also by Rand, analyzes base logistics as they support and maintain Air Force bases world-wide (2:370, 374). LOG-PLAN-X is one of the many logistical simulations designed and developed by B.J. May (8:8). The objective of LOG-PLAN-X is to

> . . .emphasize the nature, significance, and interraction of decisions (and indecision) made in specific functional areas of operational logistic support and in particular the relationship of these decisions to operational plans [9:1].

Simulations such as LOG-PLAN-X do not require specialized knowledge in any particular logistical function, since the teaching of logistic procedures is not one of the objectives.

Simulations such as MISSLOGS and BASELOGS are properly typed as "heuristic" in nature; a heuristic simulation tends to employ rules-of-thumb rather than explicit decision rules (13:13). In contrast, a simulation such as LOG-PLAN-X can be better classified as "developmental participation" in character. Geisler, et al., examine the characteristics of selected examples of simulations in Table I. The LP-I through LP-IV simulations referenced in Table I were products of the Logistics Systems Laboratory (LSL) in the late 1950's.

> Basically, LSL was intended to provide a sufficiently reliable representation of the real-world environment of Air Force Logistics Systems to permit testing and comparison of policies and procedures [2:114].

Although Table I highlights the characteristics of many types of simulations, the concept of computer-assisted versus strictly manual format merits additional review. The decision of whether or not to utilize a computer can ultimately

TABLE I

Characteristics of Selected Examples of Simulation

Characteristic	Heuristic Games: MISSLOGS, BASELOGS	Quantitative Solution Estimates: Monte Carlo	Developmental Participation Type: War Games	Developmental Observation Type: LP-II, LP-IV	Prototype or Demonstration: LP-I, LP-III	Training: Air-Defense Simulations (SDS)
Computer Preparation	Low	None	Low	Medium	Medium	High
Use and Play	None	High	Low	None	Medium	None
Simulation of Reality	Low	Low	Low	High	Medium	High
Degree of manual participation	High	None	High	High	Low to Medium	High
Specification of decision rules	Low	Complete	Low	Medium	High	Medium
Participation of arbitrator	Low	None	Medium	Low	Low	Low
Need for embedding organizations	Low	None	High	High	High	Medium to High
Time Compression	High	Very High	Medium	Low	Medium	Low
Flexibility	Medium	Low	High	Medium	Low	Medium

Source: M.A. Geisler, W.W. Haythorn, and W.A. Steger, Simulation and the Logistics Systems Laboratory (Santa Monica, Calif.: The Rand Corporation, RM,3281-PR, September 1962), p. 9. [2:116].

determine the level of complexity a simulation will attain (Note: in this sense, "complexity" is not necessarily synonomous with "realism"). In the final analysis, the nature of the subject matter being simulated will guide the extent (if any) of computer usage. A guiding question might be: "Would a computer be used in the world to be simulated [10:4]?" Frequently, a simulation can initially be designed for manual play with the capability of being expanded for computer-assistance at a later date. Although these are not all the considerations involved in computerization, they are most likely the most important.

Research Objective

The primary objective of this research is to substantially revise the LOG-PLAN-X simulation. The need for a revised and updated version for academic use has been identified by the original designer (8).

Research Questions

In order to achieve the objectives of the thesis, the following research questions were developed to guide the effort:

1. Are the original objectives of LOG-PLAN-X still valid?

2. What additional factors/variables should be incorporated in LOG-PLAN-X to help fulfill the (potentially) revised simulation objectives?

3. What factor/variables currently incorporated in LOG-PLAN-X are no longer valid in light of the (potentially) revised objectives?

Overview of Remaining Chapters

Chapter II will provide the methodology for how the research was conducted.

Chapter III will detail how and what data were collected and analysis of the data.

Chapter IV will conclude the research and offer recommendations for usage of LOG-PLAN-X.

In addition, Appendices A, B, and C will detail the proposed revised versions of the student guide (scenario) and two maintenance concepts, respectively.

CHAPTER II

METHODOLOGY

Overview

As stated in Chapter I, a continuing need exists in the Air Force for highly trained logisticians. A specific method of helping to fulfill these training requirements is simulation gaming. This chapter will explore factors which should be considered in a comprehensive revision of LOG-PLAN-X.

Teaching Objectives

The original teaching objectives of LOG-PLAN-X focused on overall resource management philosophies rather than on specific actions relating to specific events. The simulation was designed to reward correct decisions with regard to stock-level policies, budget computations, communications, management philosophy, selection of maintenance plans, and flexibility in meeting unique situations. To be valid, a revision of LOG-PLAN-X must necessarily examine these original teaching objectives in light of present requirements.

Existing logistical education requirements are the sole justification for a simulation of this type; recent changes in these requirements are reflected in our revised LOG-PLAN-X.

"Good teaching calls for a limitation on the amount of material presented in a single (simulation) [13:7]." Although

limiting the scope of a simulation can also limit realism, often there is no alternative due to limited availability of class time for completion. But if the scope of the simulation will limit the amount of pertinent data portrayed, is there any room for extraneous material?

> There is usually some concern on the part of the designer as to whether everything in the game is to have a purpose. Should extraneous information or "noise" be introduced as in the real world, or should this be omitted? The very objective of a specific game could be to try to discover the effect of "noise" on the decisions. Noise is sometimes useful in the case approach to bring out the analytical and perceptive skills of participants. If done properly so that it does contribute to the realism and the decision makers do not feel deceived, some noise and internal contradiction can be tolerated [4:11].

"Noise" may, therefore, actually be relevant in the decision making process. Since this simulation should represent something the participants can reasonably expect to experience in the real world, it is designed to this end. If a certain amount of "noise" could be expected in the situation being simulated, inclusion of such noise would be acceptable--even desirable.

When considering teaching objectives, it can be beneficial to consider some basic advantages simulation gaming holds over the alternative of solely relying on on-the-job training. First of all, since simulation gaming does not require experimentation on the real world environment being portrayed, "alternative testing" is possible. Players are thereby stimulated to test managerial judgments without undergoing the attendant risks. But this can be a "double-

edged sword" if players are tempted to make decisions they would not normally make.

Secondly, simulation gaming allows for compression of time. Several "years" can be simulated in a few hours of class time. Since players can be apprised quickly of decision consequences, the selected teaching objectives can be emphasized immediately, albeit somewhat artificially. To the extent this compression of time contributes to the accomplishment of the teaching objectives, it is desirable.

Alternatives

Ideally, simulations should be employed only when marginal costs are less than marginal benefits. The "costs" referred to here include resources expended in design and development, as well as the "cost per student-hour" (10:3). After determination of relevant objectives, "benefits" are derived to the extent such objectives are fulfilled. This "marginal analysis" is much easier said than done. Ultimately, it will be the individual course instructors who must decide the "cost effectiveness" of applying this simulation to their agenda of instruction.

Participants

> The next step is to resolve who will participate in the game. This will determine the degree of complexity to be built into the simulation, as well as the level of decision-making required of the participants [10:3].

The education level and experience of the players will substantially influence the design of any such simulation. In

this area, our comprehensive revision of LOG-PLAN-X maintains the general thrust of its predecessor. Student players are assumed to have been "exposed" to basic statistical and quantitative decision-making concepts. Players will be in teams of from three to five (usually four) as the situation warrants.

Administration

Administration is basically unchanged. The administrator, or exercise director, will assume essentially a passive role as before. Participants, although allowed to ask questions and "pick the brain" of the administrator in a role-playing capacity, are principally responsible for play of the simulation.

The administrator will wear many "hats" during the course of play; he/she will assume any hypothetical organizational position at any given time the players choose. In addition, the administrator or exercise director will perform the mundane tasks inherent in his function such as scorekeeping, random number generation (if used), control of play, etc.

Model Definition

An important aspect of the environment being simulated is role-playing. The more the simulation permits a student to visualize himself in an assigned role, the more the teaching objectives can expect to be met.

On the average, a team should consist of four players. Roles assumed will be the Deputy Commander for Resources (DC/R),

Chief of Supply, Chief of Transportation, and Deputy Commander for Maintenance (DC/M) (see Fig. 2). The limited number of players per student team will require "dual-hatting" in many instances.

One interesting (and intentional) aspect of the organizational hierarchy depicted in Fig. 2 is the lack of a clear chain of command within the student team. That is, the DC/R is equal in line authority to the DC/M. Note carefully the difference between "authority" and "power": authority is the right to do something; power is the ability to do something. The exercise director is thus afforded a powerful tool for controlling the "flavor" of any given play of LOG-PLAN-X. Assigning two (or more) strong, autocratic-type personalities to a team will probably create a power conflict. The absence of any such personalities can cause a power vacuum.

Types of Decisions

Players are tasked with maintaining continuity of decisions rather than concentrating on specific actions. In other words, a good plan executed poorly may well be superior to a poor plan executed well. Planning is, indeed, a key element. Poor planning will invariably degenerate into "firefighting" and "management by crisis."

Initially, players are tasked with submitting a budget. The budget will be specific. The intent is to force players to plan. Allowing submission of a non-specific budget could tempt players to take the "path of least resistance" and

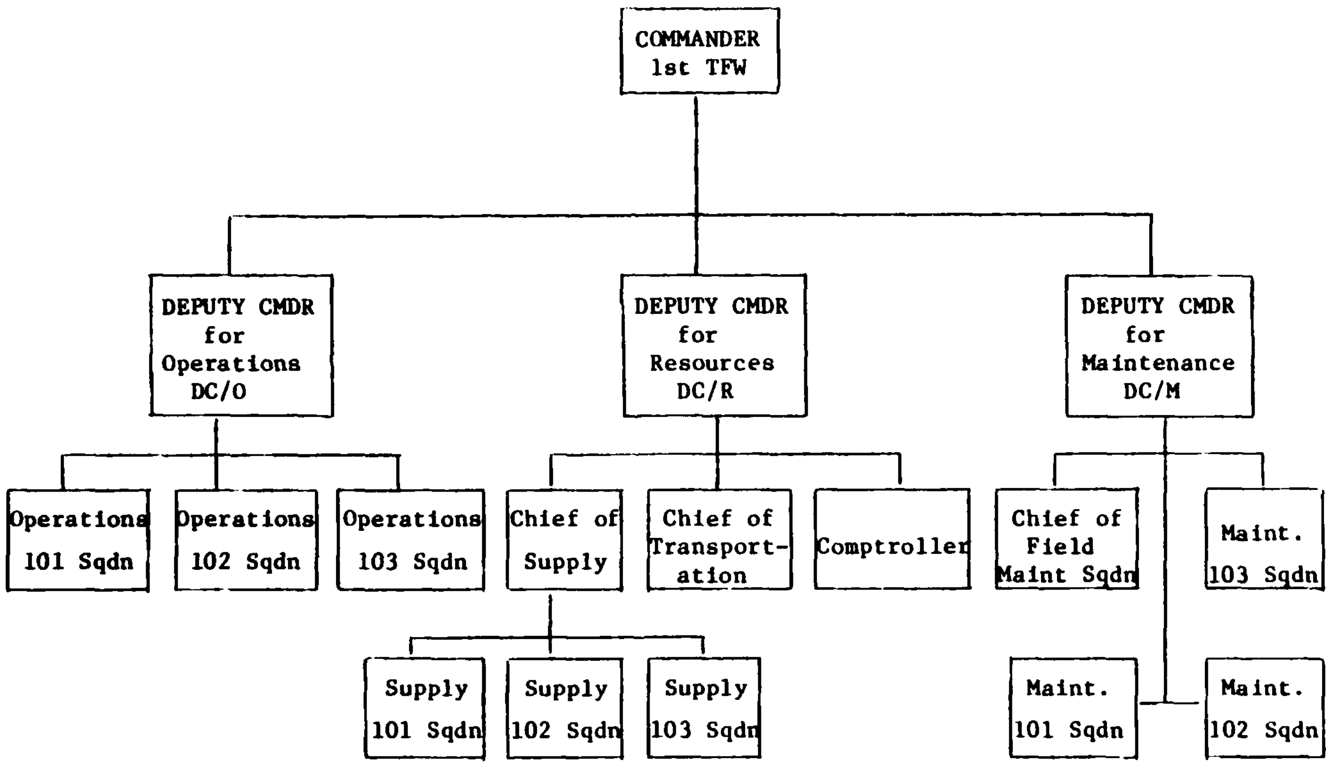

Fig 2. Extract from Organization Chart (1st Tactical Fighter Wing)
Source: LOG-PLAN-X

simply guess. The budget must include the amount of funds to be spent on transportation/distribution, supply/acquisition, and maintenance. Quantitative support figures must also be furnished. In short, students are challenged to "plan their work, then work their plan."

Time Intervals

This revised version of LOG-PLAN-X is designed to be played in one class-room day; of this, one hour is reserved for student planning, with another hour for consolidation of results and critique. The simulation itself portrays a span of fourteen bi-weekly periods--resulting in an average of approximately 15 minutes of decision time per decision period. Situations of a non-routine nature which confront students during the course of play will undoubtedly require in excess of the assumed 15-minute average. This will, of course, be offset by the expected greater number of routine bi-weekly decision periods.

Student Options

Although this simulation is concerned only with the support of one reparable type item, this revision puts greater options at the students' disposal. Previously, a student team was confronted with relatively few problems/situations during play, each requiring a relatively large amount of time for resolution. These have been replaced with a greater number of "smaller" problems. The net effect is to reduce class time for play from eight hours to six. Students are rewarded/

penalized for decisions made based on information available, not solely on results.

Manual Versus Computer

Consideration was given for expansion of the scope of LOG-PLAN-X to allow computer-assisted play. Although computerization will probably be implemented at some future point in time, the complexities inherent in such an undertaking prevented inclusion in this effort.

Summary

The purpose of this chapter has been to detail the methodology by which the revision of LOG-PLAN-X was approached. Through the provision of fundamentally different decision options, a more tactically "rich" simulation is made available. In addition, it will be more difficult for students to begin the simulation with a pre-determined solution derived from discussions with previous student teams.

CHAPTER III

DATA COLLECTION AND ANALYSIS

Need

Today there exists an expressed need for realistic simulations and gaming in the military, and particularly in military logistics. As modern day logisticians, we must become aware of the importance of such simulations and make them an integral part of our training programs. By so doing, we can involve the students in field situations quite similar to the "real thing" at a fraction of the cost of actually having the student physically sent to the exercise location. This particular chapter will cover the ideas and other facets of the operation we considered during the Data Collection and Analysis portion of the comprehensive revision of LOG-PLAN-X.

Actual Observation

During several class sessions of LOG 224, a Professional Continuing Education course offered at AFIT, the authors observed actual play of LOG-PLAN-X. A primary determinant of the success or failure in playing the simulation was the initial selection of team members. LOG-PLAN-X does not provide for a clear-cut chain of command authority structure within the simulated environment. As such, the personalities involved may be the driving success/failure factor during play.

This, of course, is today's real-life environment in specific organizations.

Personal attitudes toward the simulation (and/or the class itself) will also affect the players' level of commitment toward successful completion of the exercise. Since LOG-PLAN-X was played at the end of the four-week LOG 224 course, the course director can formulate teams based on observation of personalities and attitudes throughout the course. Consequently, a strong, authoritative leadership personality could be paired with less aggressive personalities. Thus, the course director is afforded the opportunity to create power vacuums and conflicts at will. This segregation and/or integration of personalities assisted in the development of useful role-playing which later become helpful in the situational decision-making process.

Questionnaires

A widely used technique for acquiring data in many areas of management is the use of questionnaires. In this impersonal communication mode, the researcher typically depends upon a printed/written instrument to carry the two-way communication task and at the same time obtain useful data and information. Emory has this to say about the use of questionnaires:

> With structured questioning the interviewer asks questions in a standardized format and sequence. This helps assure that each question is asked the same way in each interview, promoting measurement reliability. A standardized questioning sequence also makes it easier to develop a

> standard line of questioning that builds on prior responses. We can also use less skilled interviewers with structured questions [7:215].

Structured questionnaires were distributed to the players (LOG 224) after each exercise session as a means of acquiring some sort of feedback as to the participants' feelings and attitudes about the exercise. A number of constructive criticisms were levied for and against the project. Those ideas that were considered paramount were, in fact, incorporated into the revision of LOG-PLAN-X (see Fig. 3).

Time Considerations

The authors' ultimate objective for this particular segment of the revision process was to reduce the overall exercise playing time from eight to six classroom hours. Time constraint was one, if not "the," driving factor behind the need for the simulation revision. Current administrators wanted a "true to life" simulation that could be briefed, played, and critiqued within the span of one classroom day. Thus, the effort to reduce actual playing time with the incorporation of less time consuming situational events proved to be a primary undertaking for the authors during the revision process.

Experience

Researchers have proven that only a small portion of knowledge and experience is ever put into writing. In order to obtain an accurate account of situations within any given field of knowledge, we need to solicit the ideas and views of

LOG-PLAN-X CRITIQUE

Currently, two graduate students are revising LOG-PLAN-X as part of their thesis effort. Please complete this critique at the conclusion of the simulation. Specific, extensive comments would be appreciated!

Your Age____ Sex____Course No.____ Years of Logistics Experience_____

1. Were the objectives for playing LOG-PLAN-X made clear to you?

2. What did you feel was the MOST realistic aspect of this simulation?

3. What did you feel was the LEAST realistic aspect of this simulation and how can it be improved?

4. The "complexity suitability" of this simulation was (circle one):

   a) Much too complex
   b) Too complex
   c) About right
   d) Too easy
   e) Much too easy

5. Were the written instructions easy to understand and sufficiently comprehensive?

6. Was the oral briefing sufficient?

7. Other comments:

Thank You!

Ron Nickelson
Jay Harris

Fig 3. LOG-PLAN-X Critique

those who know what is happening (in the field) and have the experience level to match what they know about the subject. Such persons can assist in providing a more vivid insight into relationships between variables (7:89).

The experience level of the authors within the simulation field was not extensive. However, a number of the faculty members were quite familiar with the simulation gaming process and provided the authors with invaluable assistance throughout the planning and development stages of this effort.

Reliability Improvement Warranty (RIW)

The RIW Concept was introduced, along with the Queen Bee Concept, in order to give student teams the opportunity to choose from more current alternatives. The authors felt the student teams would be more familiar with the concepts involved in adopting a RIW program. The principles of the RIW program provides guidance for effective and efficient use of logistic resources. When applying these principles (RIW), we must keep in mind that the objective is to prepare the logistics system to support our capability to respond to national emergencies both at home and abroad. The RIW program provides such capabilities and afforded the authors one opportunity to reduce playing time while at the same time injecting into the simulation a concept which has become an inherent part of our logistical doctrine today.

Carl von Clausewitz discusses the principles of logistics in his book, Principles of War, in the following manner:

> The provisioning of troops, no matter how it is done, whether through storehouse or requisitions, always presents such difficulty that it must have a decisive influence on the choice of operations. It is often contrary to the most effective combination, and forces us to search for provisions when we would like to pursue victory and brilliant success [15:4-1].

Problem Structure

Our problem structure remained very similar to the problem structure within the original LOG-PLAN-X. A number of small problems were introduced with a few major problems strategically placed throughout the simulation. Those problems considered less effective were removed from the original product for the sake of reducing play time. The problem structure is composed of three segments. They are as follows:

STUDENT MANUAL

1. The simulated scenario
2. The learning objectives

STUDENT HANDOUTS

1. Actual failure data
2. Problem situations

EXERCISE DIRECTOR'S GUIDE

1. All material in Student Manual and Student Handouts
2. Impact of problem situations
3. Alternative solutions to problem situations
4. Costs, if any, associated with solutions to problem situations

The authors' intent was to allow the players maximum flexibility in choosing alternatives within the decision-making process. The problems consisted of actual maintenance, operational, or resources-related matters that might be encountered by a tactical combat operational wing.

Students were encouraged to play the roles which they were placed in, in order to give the simulation a sense of authenticity. This aspect of the simulation allowed for constant dialogue and continuous feedback which is an important property in the coordination process.

Failure Data Generation

This version of LOG-PLAN-X utilizes predetermined (randomized) failure data for play, with respect to the Poisson Distribution. This approach was chosen for several reasons. First, it allows for valid comparisons of results between student teams. This would not be possible if failure data were generated separately for each team during actual play. Secondly, generation of failure data during play would entail an additional level of complexity. This was considered especially undesirable in light of the original designer's request for a reduction in the total playing time by two class hours (6). Thirdly, predetermination of failure data affords the designer the opportunity to "massage" such data toward some desired end result (with proper respect, of course, to the Poisson Distribution). Finally, randomized failures, in the true sense of the word, is more amenable to computer-

assisted play, and could be incorporated in a computerized version.

Computer Application

Computer-aided play of LOG-PLAN-X must also be directed toward specific objectives--efficiency and effectiveness of play, reduced overall game time, and the enhancement of realism. Although the authors developed the revised version of LOG-PLAN-X to be played manually, serious consideration was also given to the computer application of the game. The use of computers in simulations differ from manually played games in that their elements can compose a much more accurate representation or model of some external reality. In this light, the players interact in much the same way they would interact with the actual reality (12).

While computerized simulations offer basically the same advantages as mentioned above, the success of any form of programmed instruction depends upon the development and the arrangement of the subject matter. The designer must use the subject matter to build or develop the simulation so as to present learning tasks and experiences to the student so that activities that enhance and contribute to the learning process are accomplished. In the report, "Computers in Higher Education," the following comments were issued:

> Use of computing is a new resource in learning. It enables the student or the scholar to deal with realistic problems rather than oversimplified models. By lessening the time spent in the drudgery of problem solving and in the analysis of data, it frees time for

> thought and insight. Partly, it enables the students to do old things more easily, but more important, it enables him to do things he otherwise could not. Computing increases the quality and scope of education [5:3].

The application of locally available computers were discussed and analyzed. Interviews with several knowledgeable persons with extensive computer background revealed that Control Data Corporation (CDC) and the HARRIS Computer Systems could be readily applied to simulations such as LOG-PLAN-X. This interface could be accomplished with the use of micro-computers (e.g. APPLE COMPUTERS). The micro-computers could be tied into the HARRIS or CDC network with portable terminals, which affords the teams and administrators total flexibility. Additionally, each team could be equipped with small portable alpha-numeric computer/calculators which would foster more accurate and realistic formulations of budgetary, usage, and demand data. In short, computer assistance would allow the participants to analyze more complex variables throughout the logistical simulation process (12).

Another major advantage of a computerized simulation is that the computer could be used to simulate and answer the "What if..." questions involved in the original scenario. This particular improvement to the simulation process affords the team members and administrators immediate and/or real-time feedback to situations that must be carefully reviewed during the initial planning stages.

<u>Chart Consideration</u>

Student feedback from previous sessions indicated a

need for a simplified version of the "Demand and Decision Record." Although we considered the basic form of the original document to be satisfactory, changes made were designed to improve student comprehension. This was also accomplished in order to facilitate the two-hour reduction in actual classroom playing time. The chart revision was a means of simplifying specific portions of the simulation that students felt were somewhat ambiguous. A primary intent was to introduce a more efficient chart without detracting from the effectiveness of the exercise.

In addition, the Poisson Distribution tables were revised to include calculations for one-half units (e.g. 5.5 or 6.5 units). This revision was necessary for calculation of total usage under the RIW option.

Summary

Timely and accurate data collection and analysis is one of the major objectives of effective research. Such was the case in revising the classroom logistical simulation LOG-PLAN-X. Maximum effort went into formulating additional concepts, situational conditions, number generations and specific calculations.

The quality of information and data received or collected for any type of decision-making is a function of its accuracy, timeliness, relevance, conciseness, objectivity, completeness, quantifiability, and clarity (15). The authors considered the above doctrine to be essential to any logistical

operation or exercise and would, therefore, like to call on all logisticians to apply the principles in each and every aspect of their daily endeavors as it relates to logistical support.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

The importance of creating and maintaining adequate logistical systems is critical to the U.S. war readiness posture. Maintaining a desired level of operational readiness within directed budgetary guidelines should be the ultimate goal of all logistical systems. This is synonymous with the "Acceptable Support - Minimum Cost" statement found in the LOG-PLAN-X student guide (9 :3-1). Within this framework, realistic simulations such as LOG-PLAN-X serve to help educate (vs train) logisticians in the importance of the development of a sound logistics doctrine. Logistics doctrine is:

> . . . a fundamental set of beliefs that forms the basis for logistics system goals and provides a guide to action in the determination of requirements and the acquisition, distribution, and maintenance of resources necessary to create and sustain military forces. It is authoritative but requires judgment in application [15:2-3].

Good planning relating to this doctrine reduces the need for "management-by-crisis" and helps bring stability to logistical programs, policies, and procedures. The current version of LOG-PLAN-X meets the objective of emphasizing the importance of good planning, but a need exists to shorten the playing time of the simulation. The proposed version of the simulation continues to meet the emphasis on planning and achieves the objectives of reducing the classroom time. This was achieved

primarily in three areas--the "Demand and Decision Record," reduction in game scope, and restructuring of problematical situations.

Demand and Decision Record

A major problem indicated by student feedback was comprehension difficulties involving this chart. Clarifications were primarily accomplished through changes in game scope (as further discussed in this chapter). Other changes involved rearrangement of the physical layout of the chart to enhance eye appeal and help create psychological distinctions between various game functions. Mathematical notations to indicate data manipulation were also added where appropriate to serve as memory aids.

Game Scope

The number of hypothetical bases portrayed in LOG-PLAN-X was reduced from three to two. In addition to shortening playing time, it also helps ease comprehension of the "Demand and Decision Record," as noted earlier.

The prior version's two-week bench check requirement was also an impediment to student comprehension (8). Elimination of this parameter simplified understanding of the simulation as a whole as well as the "Demand and Decision Record" in particular.

Restructured Problem Situations

Major time reductions were achieved through significant restructuring of the problems which confront students during

play. During actual play of LOG-PLAN-X, we noted significant portions of time being spent by students in consideration of a few major problems. Consequently, substitution with more and varied problems of reduced scope were a primary means of time reduction.

Other Considerations

New and revised factors incorporated in this version included the effects of inflation and the reliability improvement warranty concept, among others. Inflation has had and will continue to have a very real impact on DoD budgetary considerations. Inclusion of this facet was designed to confront students with a situation they will undoubtedly encounter in their respective jobs.

The reliability improvement warranty is but one of the many newer logistical concepts currently coming into vogue. Students are thus afforded the opportunities to experience the advantages and attendant problems such alternatives pose.

Summary

In summary, we recognize that simulations such as LOG-PLAN-X will continue to be meaningful educational tools. They provide students of logistics opportunities to learn to plan, make policies, test these plans and policies, and get a "hands-on" feeling of logistics problems in a field environment without the risks associated with real-world decision-making. The proposed changes to LOG-PLAN-X have been made to reduce classroom time, simplify record-keeping, and add new

logistic models. This has been achieved without degradation of the objectives of the simulation.

Time considerations mitigated against our playtesting of the proposed version. Future developments/improvements should include computerization as well as keeping pace with logistics trends. Although perfection in such endeavors as these is unattainable, continued improvement will be all the more vital as we face the challenges of tomorrow.

APPENDIX A

STUDENT GUIDE

TABLE OF CONTENTS

7.113 Repair Costs
7.114 Repair Capacities
7.115 Credit for Return of Surplus

7.12 The Reliability Improvement Warranty
7.121 Bench-Check Procedures
7.122 Repair Times
7.123 Repair Costs
7.124 Repair Capacities
7.125 Credit for Return of Surplus

8.0 SUPPLY/ACQUISITION FACTORS

8.1 Supply Organization
8.2 War Readiness Spares Kit (WRSK)
8.3 Re-supply Procedure
8.31 Shipping Times
8.32 Cost
8.33 Lead-Times
8.34 Production Capacity

9.0 RANDOM FAILURES

10.0 DEMAND AND DECISION RECORD

10.1 End of Period
10.2 Wing Assets
10.21 Due-in
10.22 On-hand
10.3 Base Assets
10.31 Bases
10.32 Failure Summary
10.4 Costs

LOG-PLAN-X

[1.0] BASIC OBJECTIVES

The objective of this simulation is to emphasize the nature, significance, and interactions of decisions (and in-decision) made in a specific functional area of operational logistic support. As a second objective, the exercise is designed to provide the opportunity of applying and testing management and decision making skills in a logistics environment. This Logistics Planning Exercise (LOG-PLAN-X) attempts to fulfill these objectives by demonstrating the interrelationship and interdependence of the various logistical decisions required when supporting the operations of a weapon system deployed in a foreign country. Such a deployment would normally be implemented to honor a treaty obligation.

All logistic decisions should be made with a goal of providing acceptable and timely support at the least cost. Acceptable and timely support (effectiveness) must always be the first consideration; but if it were the only consideration, there would be little problem in providing support. Support problems arise due to scarcity of resources--often expressed in terms of money. Inadequate funding can manifest itself in many ways. These include production and transportation capacity, training and availability of personnel, and alternate uses of resources. The logistician is, therefore, always faced with the dual (conflicting) objectives of providing

acceptable and timely support (effectiveness) at the least cost (efficiency). So it is in LOG-PLAN-X. To put it succinctly, if somewhat tritely, the objective around which all logistic decisions should be made is "Acceptable Support--Minimum Cost."

[2.0] THE SIMULATED ENVIRONMENT

[2.1] The Operational Environment. The country of Zagruvia and its adjacent island possessions are supported through the Mutual Aid Defense Organization (MADO) of which the U.S. is a participating member. The principal threat to the security of Zagruvia is the neighboring country of AGGRESSOR. In view of AGGRESSOR's hostile activity along the eastern border of Zagruvia, the MADO country has requested a USAF Tactical Fighter Wing be deployed in the Zagruvian area. The 1st Tactical Fighter Wing (TFW) has been assigned this commitment. The deployment is expected to last until 31 March 19X3.

The time is now 30 June 19X2 and the first two of the three squadrons to be deployed is to be operational by 1 September 19X2.

[2.11] The Operations Plan. The following information has been extracted from the OPERATIONS PLAN:

[2.111] Deployment (see Map)

SQDN	LOCATION	OPERATIONAL ZONE	OPERATIONAL DATE
101st	ZAG Air Base (ZAB)	Zone I	1 Sep X2
102nd	ZAG Air Base (ZAB)	Zone II	1 Sep X2
103rd	LAUCKZ Air Base (LAB)	Zone III	16 Sep X2

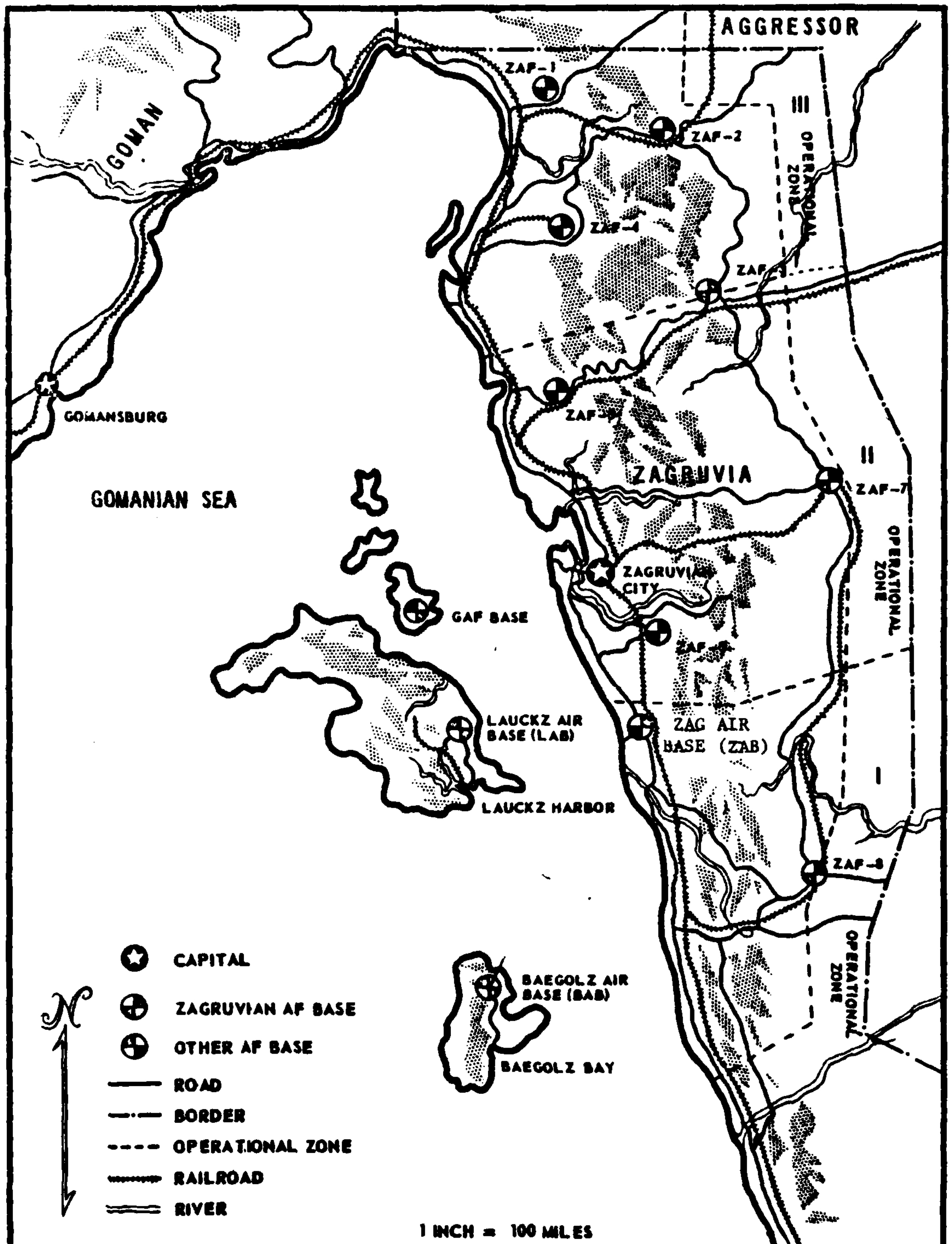

Fig A-1. Map of Zagruvia

Tentatively, all squadrons will remain deployed until 31 March 19X3. A War Readiness Spares Kit (WRSK) will accompany the 101st and 102nd Squadrons (only); the WRSK authorization for the 1st TFW is 36 regulators.

[2.112] Flying Hours --1800 flying hours per Wing, per month (when all squadrons deployed).

[2.113] Sortie Rate --Ten operational sorties per squadron, per day.

[2.12] The Operational Background. The 1st TFW has been based at N.V. UBBLE AFB in the continental United States (CONUS) since it was first activated on 1 July 19X1. All squadrons in the 1st TFW are equipped with twenty F222H aircraft--America's most advanced all-weather fighter. All squadrons have operated from the same base; the Wing flew 14,090 hours since activated.

[2.2] The Logistical Environment. The Deputy Commander for Resources (DC/R) for the Wing and his staff, and the Deputy Commander for Maintenance (DC/M), currently located at N.V. UBBLE AFB, will be assigned to Zagruvia and positioned at Wing HQ located at ZAB Air Base (ZAB) by 31 August 19X2.

This simulation is concerned with supporting the deployed squadrons with one reparable type item--a Pressure Regulator. The function of the regulator is to control atmospheric pressure both in the cockpit and in the equipment bay of the aircraft; two regulators are installed on each aircraft. Failure of either of the Regulators will abort the mission.

It is a Government Furnished Aeronautical Equipment (GFAE) item and XY-ALC is Prime for the item. AB-ALC is the Technological Repair Center (TRC); McLockwell is the prime contractor for the Regulator.

Aircraft will not be flown operationally unless two serviceable Regulators are installed. Therefore, providing acceptable and timely support will prevent a NMCS (Not Mission Capable--Supply) condition. To emphasize the importance of maintaining acceptable and timely support, a penalty will be imposed whenever failure to meet this objective causes a NMCS condition.

[3.0] THE PLAYING PROCEDURE

[3.1] The Exercise Phases. LOG-PLAN-X is divided into three phases:

Phase I - Briefing and Preparation

Phase II - Play

Phase III - Critique

[3.11] Phase I. Students must prepare themselves for this phase of LOG-PLAN-X by thoroughly reading this manual. This is necessary to make the Briefing meaningful. This is vital! The Briefing will explain the mechanics of the game--decision-making, scoring, record-keeping, computer use (if any), etc. Following the Briefing, and as a prerequisite for the start of Phase II, each team must collectively determine its initial decisions and logistics plans and policies.

[3.12] Phase II. Implementation of the initial decision starts play of the simulation. Decisions are made on a bi-weekly basis for the duration of the deployment.

[3.13] Phase III. The critique is an important element of the simulation. In retrospect, policies will be analyzed, decisions and alternatives examined, effectiveness and cost of logistic support compared, and lessons-learned highlighted.

[3.2] Player Roles. Students will normally operate in 4-person teams. The main decisions to be made bi-weekly are in the following three functional areas of logistics:

Supply and Acquisition

Distribution and Transportation

Maintenance

Additionally, it is important to ensure Plans, Policies and Programs are formulated and implemented with budgeting and funding given close and constant attention.

[3.3] Exercise Director Role. A member of the faculty will be assigned to each team to act as Exercise Director (ED). The ED will be responsible for the interpretation of ground rules, the adjudication of situations, the flow of information and data, and the guidance of the team. If the game is being played manually (i.e., without the assistance of a computer), s/he will maintain the Demand and Decision Record upon which all decisions will be recorded (see final page of Student Guide).

The ED will also assume any "outside" role necessary.

For example, if it is considered necessary to talk to the Deputy Commander for Operations (DC/O), the ED will assume that role.

[3.4] Computer Role. LOG-PLAN-X is designed for both manual and computer play. When computer facilities are available, they will be used as a planning and forecasting tool as well as maintaining essential records.

[3.5] Administration. Each team will be allocated suitable accommodations. Secretarial help will not be necessary. Computer services will be provided if available. Teams should recognize the competitive nature of the simulation and maintain security of their decisions and policies until completion of the exercise.

[3.6] Problems. Three types of problems will be encountered. These are:

[3.61] Inherent Problems. These are the problems normally associated with the logistical support of a weapon system. Examples of this type of problem are the necessity to reduce lead-times or the requirement to cut costs. These are the problems each team must deal with. Some of these problems will be of their own volition, others inherent in the system.

[3.62] Current Problems. These are day-to-day situations that arise. An example of this type of problem would be evaluating the impact of a change in the flying hour program. Situations such as these will be given to teams from time to time.

[3.63] Chaotic Problem. The chaotic problem is usually an "after-the-fact" problem which describes specific conditions that exist. An example of this type of situation would be that a strike at the contractor's plant had negated its repair capacity and that the strike is expected to last at least two months. This type of situation requires immediate analysis and action. The problem is obvious: the solution usually less so and requires a determination and examination of alternatives. This type of situation can also be expected by teams from time to time.

[4.0] DECISION MAKING

Decisions will be made twice a month--half-way through a month and at the end of a month--with usage data provided in the same time-frame. This, of course, bears little resemblance to real-life where decisions are made as soon as events warrant. To simulate such a real-life situation would mean very few weeks of support could be simulated in a class-room day. Consequently, realism has been "traded-off" for playability.

Decisions will only be made on the 15th day of every month and the last day of every month--and at no other time! Recognition of this ground rule is important.

It is essential that another important feature of this simulation be recognized--the decision-making process itself. Normally, the time limits on decisions will not be imposed. However, this does not mean every decision should be the basis for debate; most decisions will be of a routine

nature. With proper initial planning (i.e., overall logistic objective and support policies), most decisions needing to be made each period will be readily apparent.

Another important point for students to realize is decisions should be based on logic and facts and always directed towards the objective. Deciding how to do it is just as important as deciding what to do. Alternatives (once recognized) must be analyzed. Logical analysis will usually determine the best alternative.

Although this simulation is a team effort, decisions should be arrived at through application of sound management principles. In other words, decisions should not be arrived at by a majority vote.

Certain policies and decisions must initially be made by each team, based on the available information. After initial decisions have been made, the simulation will progress in bi-weekly intervals; usage data and other information will be provded at each interval. Each team will make decisions during the same time interval. The simulation will proceed through a planned deployment.

Some major decisions to be made are related to the following questions:

(a) What are the proper stock levels at each base?

(b) How many Regulators should be requisitioned from CONUS for each bi-weekly period?

(c) What requisitioning priority should be used?

(d) Should the reparable stock be repaired-overhauled?

If so, by whom and at what priority?

(e) How should the Wing serviceable stock be distributed, if at all? If so, to which bases and in what quantities and by what means of transportation (expedited or routine)?

(f) Are actual usages approximating to expected usages? If not, why not?

(g) Are expenditures consistent with budget authorizations?

Note well! Proper initial planning will prevent decision-making from degenerating into "fire-fighting."

[5.0] DECISION RECORDING

In a logistics management simulation such as LOG-PLAN-X, the recording of decisions, maintaining of cost accounts, and the portrayal of current inventory positions are all very important facets of the exercise. The effectiveness of the support can only be established/ascertained by careful and thorough analysis of these records. On the other hand, care must be taken to ensure the simulation does not degenerate into merely a chart-filling exercise.

When computer facilities are available, the bi-weekly team decisions will be printed-out, showing the up-dated logistics support status. In the manual mode, a manually maintained, consolidated record will record all necessary information. This record will be maintained by the ED, so eams can devote their time to decision-making. A replica of

the Demand and Decision Record used in the manual mode is reproduced on the final page of this Student Guide. All costs incurred as a result of decisions will be recorded on this chart; the inventory and usage status will also be continuously displayed.

Although this overall picture will be discussed and maintained by the ED, students should feel free to develop any additional records/charts they feel would assist their team in decision-making. However, no separate forms have been designed for this purpose.

[6.0] LOGISTICS FACTORS

[6.1] Organization. The 1st TFW is organized in accordance with current TAC policies and directives. An extract from the wing organization chart is given in Fig. A-2. Each squadron has a Supply Officer and a Maintenance Officer. When the Wing deploys to Zagruvia, a Field Maintenance Squadron (FMS) will be established at ZAG Air Base. Whether the FMS facilities will be available to repair/overhaul the Regulator is a decision to be made by each team.

Base Supply facilities will be established at ZAG Air Base (ZAB), and all serviceable items will be received and distributed to the squadrons as directed by the DC/R's staff. Only limited storage facilities will be available at squadron level.

[6.2] The Item. The Pressure Regulator is a high-cost, reparable-type item which has a high failure rate.

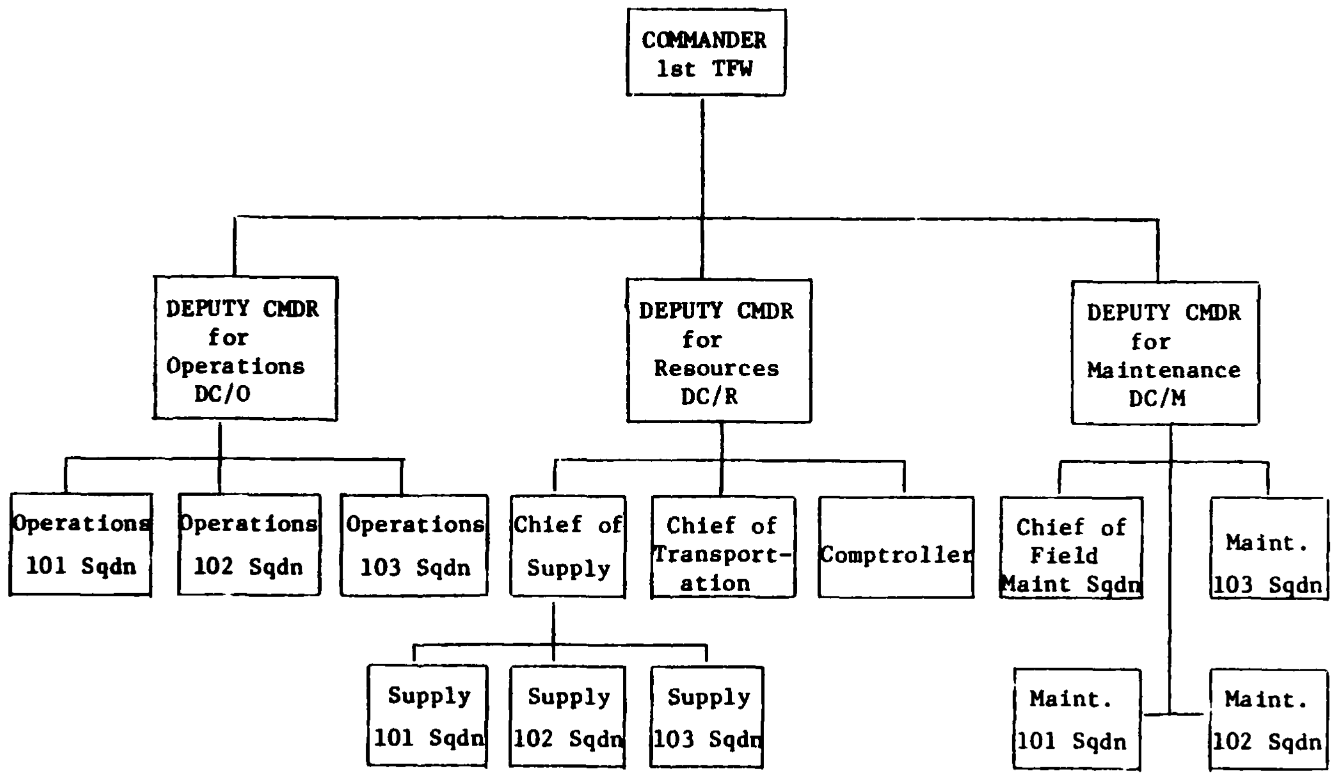

Fig A-2. Extract from Organization Chart

This failure rate is associated with the high inlet air temperature going through the Regulator--some 700° Fahrenheit.

Consumption data accumulated to date indicates the Regulator has experienced a 10% failure rate. This failure rate means that under normal flying conditions and the flying hour program to date (about 1200 hours per Wing per month), the average monthly failures have been 12 per Wing (i.e., 60 aircraft x 2 Regulators per aircraft x 10%). The Regulator is not subject to mandatory time removal--it fails randomly. This randomness is closely associated with flying hours; that is, the number of failures changes proportionally as flying hours change. The failure rate also follows the Poisson Distribution. The application of this statistical probability formula is given in [9.0].

[6.3] Budget Estimates and Authorizations. Headquarters AF has imposed severe budgetary constraints on this deployment. In turn, Headquarters TAC requires a budget estimate to be submitted for the logistical support of the Wing with respect to the Regulator with due regard to this budget austerity. The budget is in three elements--Supply/ Acquisition, Maintenance, and Transportation/Distribution. It will be based on the Maintenance Concept which the team has chosen; it must include the cost of converting and shipping the Support Equipment (SE) required for Regulator repair if the 'Queen Bee' option is elected. The budget will be reviewed by Headquarters TAC; when approval is obtained for each element of the budget, your team will be informed.

Over-expenditures must be carefully guarded against!

With the approval of the DC/R, funds may be transferred from one "account" to another. However, any such transfer will incur a punitive cost of 25% of the amount transferred. Over-expenditure of the budget may be requested and, if approved, will incur a punitive cost of 50%.

[6.4] Costs. Cost is an important factor in most management decisions. Consequently, there are costs associated with decisions--decisions good or bad, indecision, or lack of decision-- in this exercise.

The costs for specific decisions in each functional logistics area are detailed in the appropriate sections. The exercise should be played with as much realism as the situation permits, using the background, experience, or just plain logic of the participants. For instance, from time to time a team may want to initiate some particular action to correct a specific situation, investigate a potential problem area, or in some way improve the logistic management for which it is responsible. Accordingly, if a team considers some specific action should be taken, a team member should explain his recommendation to the ED. Such a recommendation will be evaluated on its merits, validity, and practicality (practical in the sense of monitoring the simulation). However, an approved recommendation may incur some additional cost. Any such costs will be assessed by the ED and will be incurred if the team decides to implement the recommendation. Some recommendations may have to be disapproved--not because they

are unsound, but because they would be impractical to administer in the simulation. In such cases, the ED may award an "Incentive Award." It is important to recognize that team members must make any such recommendation. The ED is not responsible for suggesting what should be done or if anything should be done at all.

Costs will take two forms--Direct Costs and Penalty Costs. Direct Costs are those reimbursable-type costs such as cost to overhaul/repair Regulators, cost of shipping Regulators, and the cost of Regulators requisitioned. These are your initially budgeted costs. Penalty costs are those costs which will be incurred for failure to meet the basic objective. Inadequate support will incur such Penalty Costs, as will overspending budget authorizations (see 6.3). Penalty Costs are, obviously, not Budgeted Costs.

Since cost is an important aspect of this simulation, all team members should be conversant with all costs--not only those associated with their particular responsibility.

[6.5] Operational Readiness. Providing acceptable support at a base when a requirement generates will prevent a NMCS condition. Although a grounded aircraft is a serious liability, to ensure 100% support availability would impose a financial burden which would be unacceptable. Indeed, this balance between support and the cost of such support has been recognized; the following communication has been received from the Commander of the 1st Tactical Fighter Wing (1stTFW/CC). (For purposes of this simulation, it cannot be assumed there

30 June 19X2

FROM: Commander, 1st TFW

SUBJ: Logistical Support During Wing Deployment

TO: Deputy Commander for Resources, 1st TFW

REF: CØ/1/5

1. With the upcoming deployment of the 1st TFW to Zagruvia, I require assurance that our logistical support will enable the Wing to meet its operational commitments while deployed. I recognize that severe budgetary restrictions have been imposed, but nevertheless your support policies should provide a confidence level of at least 95% against a NMCS condition.

2. Should a NMCS condition arise through failure to maintain this confidence level, your organization will be penalized $7500 for each and every NMCS.

3. Detail for me, in writing, your recommended stockage policies for this item.

SAM O'BRIAN, Colonel, USAF
Commander, 1st TFW

are aircraft undergoing maintenance which can be cannibalized to keep other aircraft serviceable.)

[6.6] Usage Data. Again, it should be recognized that failure (usage) data will be given to teams on a bi-weekly basis and decisions are only made twice monthly--on the 15th of the month and the last day of the month. Team decisions, therefore, must be made in anticipation of expected usage. For example, when a team has made all its decisions on the 15th of October, it will be given Regulator failure (usage) rates for the final two weeks of October. Support actions on the 15th of October, in conjunction with previous actions, should ensure a 95% confidence level of support for those last two weeks of October. Providing adequate support will avoid a NMCS condition and the corresponding penalty. The support must be located where it is needed, when it is needed. Although more than enough Regulators may be on-hand at the 101st Squadron's base, insufficient stock at the 103rd Squadron could cause a NMCS condition at that squadron. At the next decision period it may be decided to ship Regulators from the 101st Squadron to the 103rd Squadron, but this will not negate any NMCS penalty which may have already been incurred.

[7.0] MAINTENANCE FACTORS

[7.1] Maintenance Concepts. The Wing has been operating under the Base Self-Sufficiency concept and the majority of the Regulators which have failed have been

overhauled/repaired by Wing personnel. The NRTS (Not Repairable This Station) rate has been 10%. Because of excessive cost in manpower and equipment, squadrons are not authorized to repair this item. Therefore, all unserviceable Regulators are returned to Wing Maintenance for repair/overhaul (if possible) after bench-check.

The impact of this factor is that only one set of Support Equipment (SE) is available in the Wing and however desirable, logistically and operationally, it would be for each squadron to be Base Self-Sufficient when it deploys overseas, this is not practical. It is practical, however, to ship this one set of SE and the necessary technical personnel to one of the overseas bases and operate the 'Queen Bee' concept, whereby the selected base would repair reparables for all three squadrons. To decide whether or not to implement this concept, a cost analysis must be made using the factors described in the appropriate sub-section. The alternative to the 'Queen Bee' is the 'Reliability Improvement Warranty,' which is also described in a sub-section.

[7.11] The 'Queen Bee' (QB) Concept. The ZAF confirms that suitable accommodations could be made available at ZAG Air Base (ZAB) to enable Base Maintenance facilities to be established. Any SE, however, would have to be converted from 120V, 60 cycle to 220V, 50 cycle. If this modification to the SE is authorized immediately (30 June 19X2), the equipment could be in place and operational at ZAB by 30 September 19X2. In the interim period, there would be a

loss of use of the equipment necessitating the overhaul of reparables by AB-ALC instead of the Base. A 'loss-of-use' cost of $2500 will be assessed each time a conversion is made (i.e., upon deployment and again on return to CONUS). The cost of converting the SE to the correct voltage and cycle would be $500 each time; shipping cost for the SE, one way, would be $5000. Repair times, costs, and capacities are explained in the appropriate sub-sections.

Under the 'Queen Bee' concept, all reparable Regulators will be sent to ZAG Air Base (ZAB) where the Field Maintenance Squadron with its facilities and personnel will be established. After repair, the serviceable Regulators will be held in Base Supply pending shipping instructions from the DC/R. Squadrons will not necessarily receive the same Regulators which they sent for repair.

[7.111] Bench-check Procedure. Squadron-level bench checks are assumed to be performed immediately upon removal of a defective Regulator from an aircraft (before forwarding to Wing Maintenance for possible repair/overhaul). There is no cost involved; expended time is considered insignificant.

When unserviceable Regulators are received at the Field Maintenance Squadron (if the 'Queen Bee' option is elected), a further, extensive bench check is performed to determine if they can be repaired at Wing-level or must be returned to AB-ALC as NRTS. Likewise, this latter bench check is not costed and expended time is considered insignificant.

[7.112] Repair Times. Base Maintenance at ZAB:

Routine Repair - 28 days

Expedited Repair - 14 days

[7.113] Repair Costs. Base Maintenance at ZAB:

Routine Repair - $600 per Regulator

Expedite Repair - $1000 per Regulator

[7.114] Repair Capacities. Base Maintanance at ZAB:

Output: 6 Regulators every bi-weekly period. Can be increased up to 8 if the difference is expedited.

[7.115] Credit for Return of Surplus. After bench check, Regulators determined to be reparable by the Field Maintenance Squadron ('Queen Bee' concept, only) will subsequently be either repaired at ZAB or returned to CONUS. Reparables surplus to requirements should be returned to the TRC owing to the short supply within the logistic system for these Regulators. Any reparable Regulators returned to CONUS under these conditions will result in a $500 credit per unit. Although this credit cannot be used to supplement budget expenditures, it will be taken into account at the end of the simulation to reduce the total overall cost of logistic support.

[7.12] The Reliability Improvement Warranty. A team must choose between one of two maintenance concepts: the 'Queen Bee' (QB), or the 'Reliability Improvement Warranty' (RIW). Under the RIW concept, the contractor furnishing the Regulator to the government agrees to repair the item for a specified period of time. The cost of such repair is reflected

in the initial acquisition cost of the item. Naturally, such acquisition cost will be higher than would be the cost of an item acquired without such a warranty. Since the contractor must repair the item as well as produce it, he will be incentivized to produce a higher quality item which will require relatively less maintenance/overhaul over its life cycle. This is graphically portrayed in Figures A-3 and A-4.

Since the RIW concept has not yet been tested in an operational environment, teams will have the option for such a 'test' in lieu of the QB concept. Should your team select the RIW option, no repair facilities would exist in Zagruvia; all unserviceable Regulators must necessarily be returned to CONUS for repair/overhaul by the contractor.

Under the RIW concept, all unserviceable Regulators must be shipped to CONUS for repair/overhaul after the preliminary (Squadron) bench check. After necessary repairs have been performed, the now-serviceable Regulator will be shipped back to ZAB. Preliminary estimates place the Mean Time Between Failure (MTBF) at 200 hours for the improved Regulators available under this concept; this should be compared with the 100 hours MTBF for the Regulators currently installed. The 200 hours MTBF for the new Regulator is nothing more than a "best guess" at this point: more reliable data will be available at some point during the deployment for consideration. In effect, this increased MTBF will lower the random failure rate from 10% to 5%.

Before deploying to Zagruvia, all Regulators currently

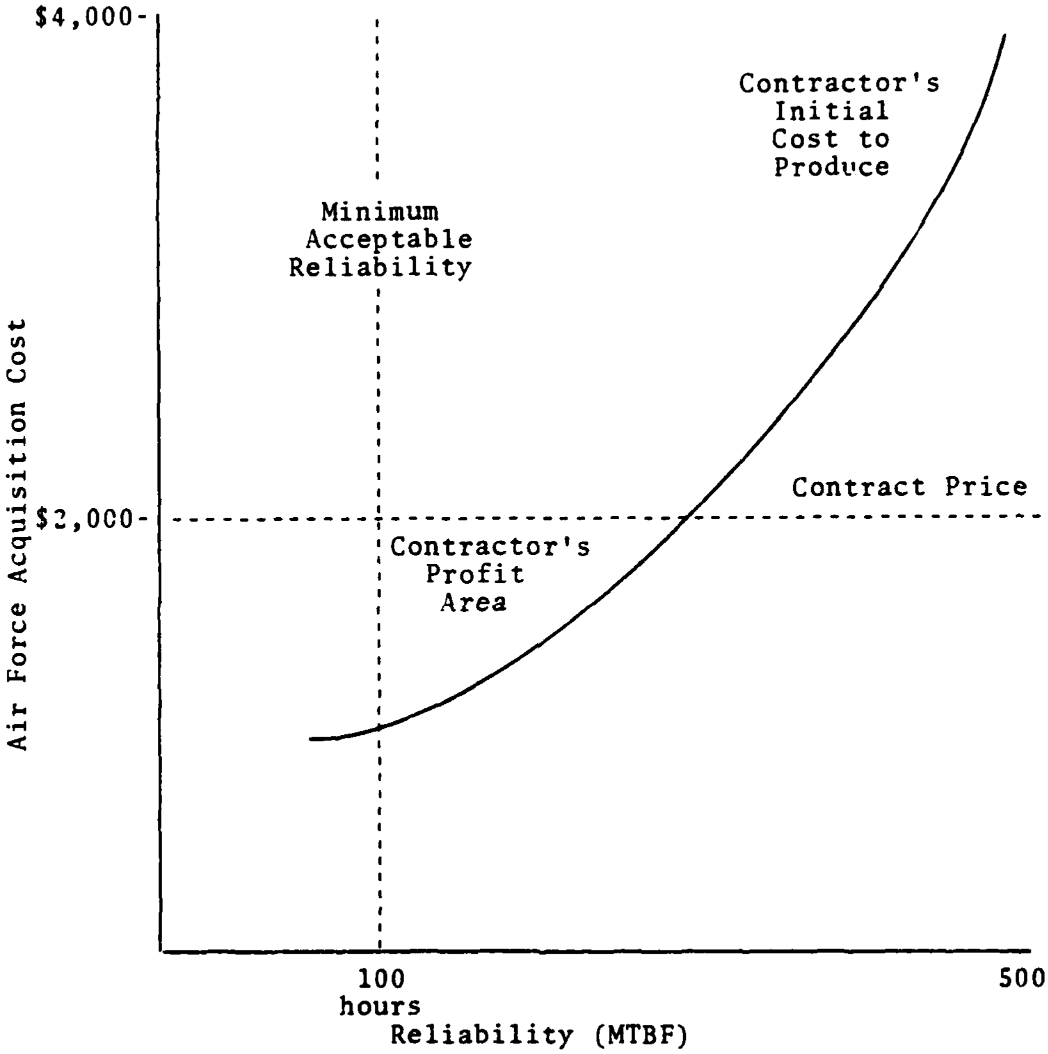

Fig A-3. Effect of Reliability on Initial Cost, Queen Bee Concept

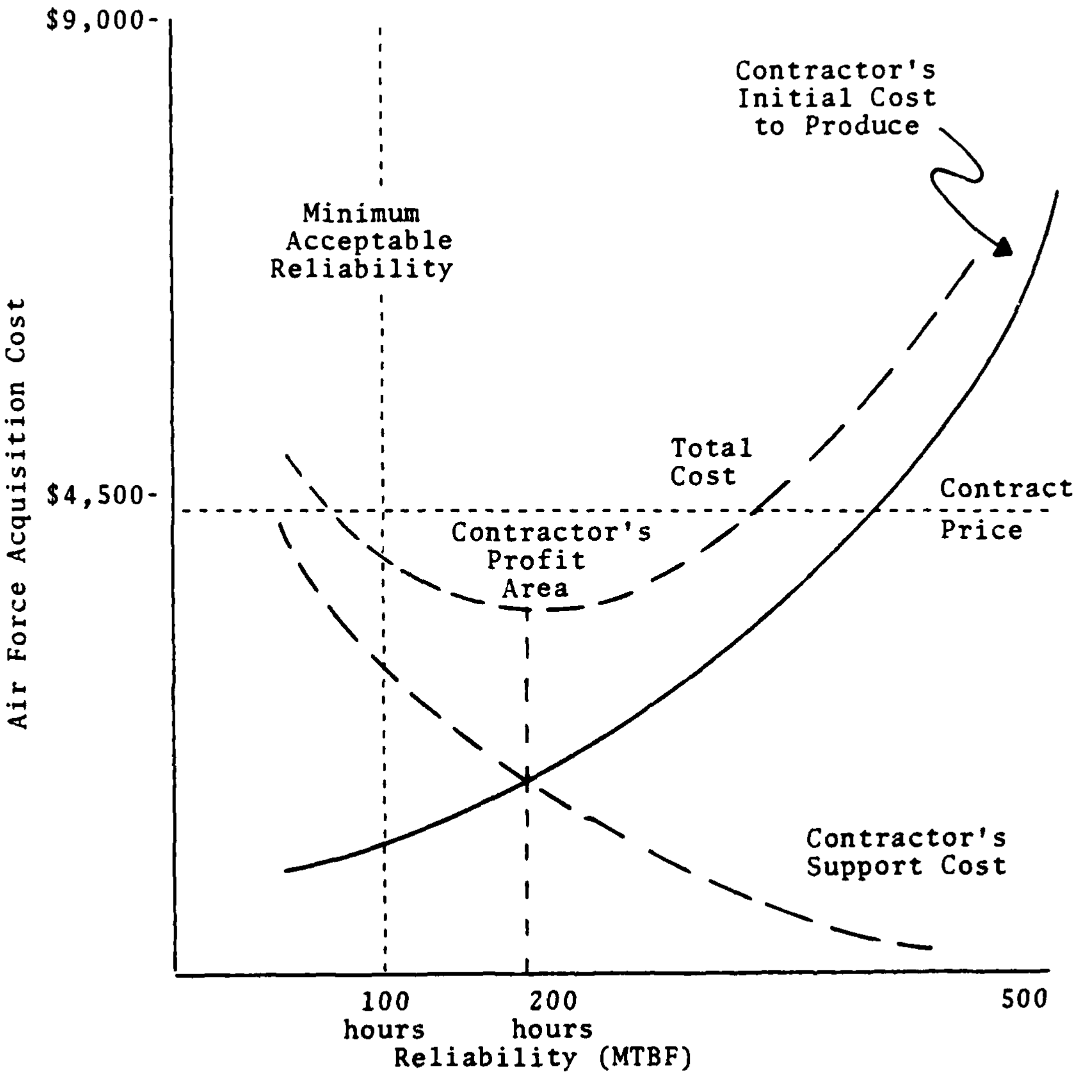

Fig A-4. *Effect of Reliability on Initial and Support Costs,*
Reliability Improvement Warranty Concept (RIW)

being used in the 1st TFW would have to be exchanged for the new Regulators under the RIW concept; this includes all Regulators currently on-hand: 120 installed on aircraft and 36 shown as being in the WRSK. Since the contractor will warrant the new Regulator for an extended period of time, a portion of the initial acquisition cost is chargeable to this deployment. Similarly, any allowance received for turn-in of old (currently on-hand) Regulators will only be partially creditable for this deployment. In effect, such credits (already negotiated with the contractor) serve to reduce the acquisition price of the new Regulators. Should the RIW option be selected, it has been determined that all new Regulators will be installed/on-hand by 31 August 19X2.

[7.121] Bench-Check Procedure. (See 7.111)

[7.122] Repair Times. Repair time at contractor's plant: 14 days.

[7.123] Repair Costs. Not applicable: included in contract.

[7.124] Repair Capacities. Effectively unlimited.

[7.125] Credit for Return of Surplus. None.

[8.0] SUPPLY/ACQUISITION FACTORS

[8.1] Supply Organization. When the Wing deploys to Zagruvia, a Base Supply organization will be established at ZAG Air Base (ZAB). The Chief of Supply, on the staff of the DC/R, will be responsible for this organization. Each squadron will have a squadron supply point and a squadron

Supply Officer. All serviceable stock will be received by Base Supply (ZAB) and distributed to the Squadrons on instructions from the Chief of Supply. Distribution decisions are made on the 15th and the last day of each month. Note that two squadrons, the 101st and 102nd, share a common base (ZAB). Their stock will be co-mingled; for supply purposes, they can be thought of as one single organization, but this stock will be separate from Wing Supply.

[8.2] War Readiness Spares Kit. A War Readiness Spares Kit (WRSK) for the Wing will accompany the 101st and 102nd Squadrons when they deploy if the QB option is selected; supply records indicate the WRSK contains 36 Regulators. A WRSK must also accompany these two squadrons if the RIW is selected--however, a team will have to compute a new stockage level (inventory) for this WRSK. The WRSK should contain enough Regulators to sustain operational readiness for two months--commensurate with the flying hour program. No WRSK will accompany the 103rd Squadron.

[8.3] Re-Supply Procedure. Because of the current Base Self-Sufficiency concept, very few Regulators have been returned to the TRC as NRTS, and the majority of those returned have been beyond economical repair (condemned). Consequently, additional Regulator requirements have to be procured from time to time by the Item Manager of XY-ALC. Note that the NRTS rate under the RIW option will technically be 100%. However, whether the Regulators in question are subsequently found to be reparable or not is of no concern--the

contractor is obligated to replace the Regulator under terms of the contract within the specified 14-day period (see 7.112), excluding shipping time.

At this time (30 June 19X2) there is no stock at XY-ALC and none on procurement. The Item Manager will place a procurement contract for additional Regulators to support this deployment immediately after he is notified of the total quantity required. Production lead-times and production capacity are detailed in the following sub-sections. Note that both areas are significantly improved under the RIW option. This reflects the contractor's heavy capital outlays ("tooling-up") to meet increased demand.

The Item Manager must be advised immediately of the quantity required and the delivery schedule. The acquisition and transportation costs will be charged to the deployment budgets as appropriate.

Additional Regulators may be requisitioned at any time, subject to these production lead-times, capacities, and costs.

<u>[8.31] Shipping Times</u>.

(a) <u>CONUS-ZAB</u> (or ZAB-CONUS)

Routine - 28 days

Expedited - 14 days

(b) <u>Intra-Theatre</u>

Routine - 16 days

Expedited - 1 day

[8.32] Cost Factors.

(a) QB Requisitions - $2000 per Regulator

RIW Requisitions - $700 per Regulator*

(*Although the true acquisition cost is actually $4500, the $700 is the net amount chargeable against this deployment)

RIW Credit - ($190) per old Regulator turned in**

(**Again, this is a net figure. Note that QB and RIW options are mutually exclusive)

(b) Shipping

(i) CONUS-ZAB (Requisitions or repair returns
ZAB-CONUS (Reparables returned for RIW repair only)

Routine - $50 per Regulator

Expedited - $200 per Regulator

(ii) Intra-Theatre

Routine - $50 per Regulator

Expedited - $100 per Regulator

(NOTE: Shipments to ZAB (101st/102nd) will be shipped in 1 day and will not be costed)

[8.33] Lead Times

QB Option - 3 months

RIW Option - 6 weeks

[8.34] Production Capacity.

QB Option - 4 every 2 weeks

RIW Option - 16 every 2 weeks, except initial purchase to "exchange" old Regulators for new is unlimited (reflects extensive subcontracting.)

As an example, a routine shipment of Regulators acquired under the QB option would arrive in Zagruvia by the end of October; an expedited shipment of same would arrive by 15 October.

[9.0] RANDOM FAILURES

The majority of the items in the Air Force invent ry fail randomly. That is, their exact usage in any given period cannot be predicted with accuracy. The shorter that given period, the more difficult it is to predict the usage/failures. Failures (or usage) can usually be associated with certain factors such as flying hours, sortie rates, number of aircraft, or whatever appropriate factor is most suitable for the item. However, in the case of a great many items, their usage follows predictable patterns and although it may not be possible to predict exactly the actual usage, it may be possible to predict the likelihood of certain usage occurring. The random failure of these Regulators follows one of these probability patterns. This particular pattern is known as the Poisson Distribution Curve. By using this formula, it is possible to predict the number of times when a particular usage will occur.

The following tables show the application of this mathematical formula for a range of average demands. To use the tables, therefore, it is first necessary to select an expected average usage/failure rate. To do this, the appropriate criteria must be selected: average usage per flying hour, per aircraft, per base, or whatever factor is most

appropriate.

For example, the random failure of Regulators is, of course, related to the use of the Regulator to control the anti-icing system in the aircraft. This, in turn, means it is related to the flying hour program. If the flying hours are increased, the Regulators will be in use more frequently and for longer periods of time; consequently, the chance of a failure is increased. The next factor to be considered is the time factor. Given a certain flying hour program, how many Regulators will fail in a particular period? In this simulation, all decisions are made bi-weekly; the exercise proceeds in bi-weekly periods, and failures are generated bi-weekly. It follows, therefore, that the factors to be considered are flying hours, the bi-weekly periods, and recognition that the failures are related to the individual bases.

It is necessary to compute the AVERAGE number of random failures per base, per bi-weekly period based on the projected flying hour program, and historical usage rates.

Having determined the AVERAGE usage/failure rate, it is now necessary to examine the probability of experiencing usage other than the average. For example, if the AVERAGE usage per base per bi-weekly period is six, what is the probability of actually using nine in the base in question? This question is answered by application of the Poisson Distribution Curve. An intelligent use of this formula will give excellent guidance in the determination of the Safety Levels which, in turn, will determine the degree of support involved.

The following two tables show the probability of actual failures occurring in a particular period for various given AVERAGE bi-weekly period failures. Table A-1 shows the probability of a specific usage and Table A-II shows the probability of a combination of usages up to and including a specific quantity.

These tables can be used to predict the possibility of a given number of occurrences during any bi-weekly period. For example, using Table A-I, if the average failure or usage is six Regulator per base per bi-weekly period, then we can expect eight actual failures to occur eleven times every 100 bi-weekly periods. Table A-II also shows the possibility of less than a given number of failures per bi-weekly period. Using the same example of an AVERAGE failure or usage of six Regulators per bi-weekly period, it can be seen from Table A-II that in 85 periods out of every 100, the actual failures will be eight or less. Or, an average usage/failure rate of six and a Safety Level of 2 (giving a total stock level of eight) would provide an 85% chance of not having a stock-out or, perhaps more significantly, a 15% chance of a NMCS--in other words, an 85% confidence level.

Students' attention is drawn to the Commander's requirement of a 95% confidence level.

[10.0] DEMAND AND DECISION RECORD

If a computer is not being used, records must be manually kept. Record-keeping has been held to a minimum,

TABLE A-I

Number of Periods Out of 100 Periods That Specific Usages Can Be Expected Based on Poisson Distribution for Various Averages

Avg. Usg.	Actual Usage 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0.5	61	30	8	1													
1.0	37	37	18	6	1												
1.5	22	33	25	13	5	1											
2.0	14	26	28	18	9	3	1										
2.5	8	21	26	21	13	7	3	1									
3.0	5	15	22	23	17	10	5	1									
3.5	3	11	19	22	19	13	8	4	2	1							
4.0	2	7	15	19	20	16	10	6	3	1							
4.5	1	5	11	17	19	17	13	8	5	2	1						
5.0	1	3	9	14	17	18	14	11	6	4	2						
5.5		2	6	11	16	17	16	12	8	5	3	1					
6.0		2	4	9	14	16	16	13	11	7	4	2	1				
6.5		1	3	7	11	15	16	15	12	9	6	3	2	1			
7.0		1	2	5	9	13	15	15	13	10	7	5	2	1			
7.5			2	4	7	11	14	15	14	11	9	6	4	2	1		
8.0			1	3	6	9	12	14	14	13	10	8	4	3	3	1	
8.5			1	2	4	8	11	13	14	13	11	9	6	4	2	1	
9.0			1	1	4	6	9	11	14	13	12	9	8	5	3	2	1

TABLE A-II

Number of Periods Out of 100 Periods a Specific Usage or Less Can Be Expected Based on Poisson Distribution for Various Averages

Avg. Usg.	Actual Usage 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0.5	61	91	98	99																	
1.0	37	74	92	98																	
1.5	22	56	81	93	98	99															
2.0	14	41	68	86	94	98	99														
2.5	8	29	54	76	89	96	99														
3.0	5	20	42	65	82	92	97	99													
3.5	3	14	32	54	73	86	93	97	99												
4.0	2	9	24	43	63	79	89	95	98	99											
4.5	1	6	17	34	53	70	83	91	96	98	99										
5.0	1	4	13	27	44	62	76	87	93	97	99										
5.5		3	9	20	36	53	69	81	90	94	97	98									
6.0		2	6	15	29	45	61	74	85	92	96	98	99								
6.5		1	4	11	22	37	53	68	79	87	93	96	98								
7.0		1	3	8	17	30	45	60	73	83	90	95	97	99							
7.5			2	6	14	25	39	53	67	79	87	93	97	99							
8.0			1	4	10	19	31	45	59	72	82	90	94	97	98	99					
8.5			1	3	8	16	27	40	54	67	78	87	93	96	98	99					
9.0			1	2	6	12	21	32	39	59	71	80	88	93	96	98	99				
9.5				1	3	8	16	26	38	51	64	74	83	89	93	96	97	99			
10.0				1	3	7	13	22	33	46	58	70	79	86	92	95	97	99			
11.0				1	2	4	8	14	23	34	46	58	69	78	85	91	94	97	98	99	
12.0					1	2	5	9	16	24	35	46	58	68	77	84	90	94	96	98	99

and all records will be recorded in one form: the DEMAND AND DECISION RECORD. This record will normally be maintained by the ED, but it is important that all players fully understand the information portrayed on this record. The following brief notes should assist in this understanding. A copy of this record is included as the last page of the Student Guide. Please do not write in this book!

[10.1] End of Period. This is the 15th of the month or the last day of the month. The information shown for a particular period is the status of logistic support at Wing Level and the two bases as of the 15th of the month or last day of the month after taking into account all receipts and usage.

[10.2] Wing Assets.

[10.21] Due-In. The two "due-in" columns indicate the quantities received during the period--received from Base Repair (if QB selected) and from CONUS (new requisitions under the QB option; repairs and requisitions under the RIW option). The columns are divided diagonally to indicate whether the receipts are from Expedited or Routine action.

[10.22] On-Hand. The two "on-hand" columns indicate the Serviceables and Reparables actually on-hand at Wing Level at the end of the period. The Serviceables are the total of all receipts during the period from Base Repair (if QB chosen) and CONUS, plus any serviceable quantities left in Wing Base Supply from the previous period. The Reparable quantity is that quantity which bench-check has found to be within the

capability of Base Repair (if QB) or awaiting shipment to CONUS (if RIW).

[10.3] Base Assets.

[10.31] Bases. There are three columns under each of the Bases--the "Due-In" column, the "Failed" column, and the "Ending on Hand Serviceables" column. For Lauckz Air Base (LAB), the "Due-In" column is divided in half diagonally, similar to the Wing "Due-In" column, and for the same reason. On the LEFT of the diagonal line the quantity shipped to the Base is for recording Expedited transportation; the RIGHT side of the line is for recording Routine shipments. These assets arrive on the first day of the period. The "Failed" column indicates the total quantity of Regulators which failed at the base during the period. The two "On-Hand Serviceables" columns are self-explanatory.

[10.32] Failure Summary. The Failure Summary is divided into two columns--the "Total" column and the "NRTS" column. Failures from both bases are added together each period and posted to the "Total" column. Regulators declared and posted as NRTS (if QB) are subtracted from this and immediately added to the on-hand "Reparable" column. This provides a running total of reparables which, after bench-check, have been found to be within the repair capability of Base Maintenance (if QB selected). The "NRTS" column will indicate the quantity of Regulators which are found to be beyond the repair capability of Base Maintenance (if QB) and will be returned to the TRC at AB-ALC. If the RIW is in

effect, all failed (unserviceable) Regulators are technically considered NRTS; the NRTS for any given period (i.e., all failures) will be added to the cumulative "Reparable" total.

[10.4] Costs. Costs incurred each period will be recorded in these columns, together with the cumulative costs to date.

The "Miscellaneous Cost" column will be used to record any penalty costs incurred, or any other costs which the ED considers should be charged/credited for specific actions taken (or not taken) by a team. Miscellaneous costs are not budgeted costs.

LOG-PLAN-X

END OF PERIOD	DEMAND AND DECISION RECORD																			
	WING ASSETS						BASE ASSETS						COSTS							
	DUE IN		ON HAND		FAILURE SUMMARY		ZAG (ZAB)			LAUCKZ (LAB)			CONUS REQNS.		TRANSP.		MAINT.		MISC.	
	BASE REPAIR	CONUS	SERV.	REPAR	NRTS	TOTAL	DUE IN	FAILS	END ON HAND SERV.	DUE IN	FAILS	END ON HAND SERV.	CURR.	CUM.	CURR.	CUM.	CURR.	CUM.	CURR.	CUM.
AUG 16-31																				
SEP 1-15																				
SEP 16-30																				
OCT 1-15																				
OCT 16-31																				
NOV 1-15																				
NOV 16-30																				
DEC 1-15																				
DEC 16-31																				
JAN 1-15																				
JAN 16-31																				
FEB 1-15																				
FEB 16-28																				
MAR 1-15																				
MAR 16-31																				
APR 1-15																				

APPENDIX B

EXERCISE DIRECTOR'S NOTES

(QUEEN BEE CONCEPT)

The success of any simulation exercise, in terms of achieving the learning objectives, is directly related to the participation of the students and the competency of the Exercise Director. It is the responsibility of the Exercise Director to obtain active student participation and to maintain a rapport with the students throughout the play of the game. He should not only act as a referee, but he should use the simulation as a teaching device--if necessary, stopping the game and discussing with the team policies, objectives, etc.

These Exercise Director's Notes are provided for your guidance and as an aide memoire and are not intended to be dogma. This is your personal copy of the Notes, and you are encouraged to develop your guidance notes to assist you in directing the exercise. You will find a few blank pages at the end of each Part for this purpose. If you come across any quirk in the program which should be brought to the attention of other Exercise Directors, please note this and ensure that all other Exercise Directors are informed.

These notes have been written on the premise that you have some detailed knowledge of the play of the game. If you doubt your ability to direct a game, the most effective way to learn the game in detail is to play it by yourself two or three times, scoring on the small score sheets.

An important feature both in directing the simulation and the actual play of the exercise is role-playing. Students are expected to assume a role and to play that role realistically. It is equally important that the Exercise Director also assumes roles the students want him to play and responds to the students' questions as he would in real life. He should do this very early in the game--preferably in the planning phase--so students understand the degree of realism expected.

These notes are in the following Parts:

Part I - Determining the Maintenance Plan and Budget

Part II - Cost Charts

Part III - Copy of Handout Material

Part IV - Evaluation and Critique

PART I

BASIS FOR MAINTENANCE PLAN AND BUDGET REQUEST

The following are copies of slides that will be used in the critique to explain to students one simple method in determining costs when evaluating the two major maintenance alternatives. From this type of cost analysis, it should be possible to arrive at a realistic budget. To encourage teams to submit realistic budgets, a $1000 bonus may be awarded to a team submitting a budget that does not exceed $130,000. A team submitting a budget in excess of this will be penalized 10% of the amount in excess. For example, if a team submits a budget of $135,000, the penalty would be $500--that is, 10% of ($135,000-$130,000). $130,000 is the maximum budget that will be given. $108,000 is the minimum budget that will be given.

LOG-PLAN-X

REQUIREMENTS COMPUTATION FORMULA

GROSS REQUIREMENTS	=	Total Repair Pipeline + Stock Level + (if Queen Bee) NRTS + (if RIW) Initial Aircraft exchange
TOTAL REPAIR LINE	=	Failures any one Period + Reparables Due In from Repair Next Period
STOCK LEVEL	=	Safety Level at Each Base + Average Expected Usage
NRTS	=	(Queen Bee only) Those that Cannot Be Repaired in Zagruvia Because of Capability (10% NRTS Rate)
NET REQUIREMENT (QB)	=	Gross Requirement - WRSK Kit on-hand
NET REQUIREMENT (RIW)	=	Gross Requirement + new WRSK Kit required

REQUIREMENT COMPUTATION

		Queen Bee Concept
TOTAL REPAIR PIPELINE:	Failures any one period	9
	Due in from Repair	8
	TOTAL	17
STOCK LEVEL:	Safety Level	7
	Expected Usage	9
	TOTAL	16
NRTS:	10% of Expected Usage	13
	Beyond Capacity	0
	TOTAL	13

GROSS REQUIREMENT: 17 + 16 + 13 = 46

NET REQUIREMENT: 46 - 36 = 10

LOG-PLAN-X

PROJECTED COSTS - QUEEN BEE CONCEPT ONLY

REQUISITIONS: 10 @ $2,000		$20,000
TRANSPORTATION:		
Conus-Zagruvia: 10 @ $200 (Expedited)	$2,000	
Intra-Theatre: (4x14)+3 = 59 @ $50	2,950	
Add: Expedited for 10% of 56	300	
Ship Support Equipment (2-way)	10,000	
		15,250
MAINTENANCE:		
Field Maintenance Sqdn 99 @ $600	59,400	
Add 20% Expediting (EX 20)	8,000	
Convert Support Equipment	1,000	
Loss of Use of Equipment	5,000	
		73,400
	TOTAL	$108,650

INITIAL STOCK LEVELS

Total Flying Hours → 1800/month

	100 Hrs. Avg.Usg./ 95% C.L.	167 Hrs. Avg.Usg./ 95% C.L.	200 Hrs. Avg.Usg./ 95% C.L.
101st/102nd Squadrons	5/9	3/6	2.5/5
103rd Squadron	4/7	2.4/5	2/5

NOTE: These are "per period" figures.

PART II

COST, TIME AND CAPACITY CHARTS (QUEEN BEE)

NOTE: This type of chart has, deliberately, not been given to students. A well-organized Team should produce their own chart.

1. Requisitions: Cost = $2000 each

   Prod. Time = 3 months

   Capacity = 4 every 2 weeks

2. Shipping

CONUS ZAGRUVIA

Cost		Time	
R	EX	R	EX
$50	$200	28 days	14 days

INTRA-THEATRE

Cost		Time	
R	EX	R	EX
$50	$100	16 days	1 day

Shipping cost for Support Equipment - $5,000 each way.

All shipments are made at the end of a period.

Shipments to 101/102 Sqdns will arrive in 1 day without cost.

AD-A103 252 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL--ETC F/G 5/9
A COMPREHENSIVE REVISION OF THE LOGISTICS PLANNING EXFRCISE (LO--ETC(U)
JUN 81 J F HARRIS, R L NICKELSON
UNCLASSIFIED AFIT-LSSR-30-81 NL

2 of 3

AD
A103252

3. Repair, Queen Bee Option

Field Maint. Sqdn.

Cost		Time		Capacity
R	EX	R	EX	Max 6 routine with Max Output of 10 a Period
$600	$1000	28 days	14 days	

Conus Depot (TRC)

Cost*		Time*		Capacity
R	EX	R	EX	Unlimited
$1000	$1500	28 days	14 days	

*NOTE: Plus $200 and 2 weeks (expedited) shipping

This information is not given to students in the scenario. The ED may provide upon request or at his option.

Support Equipment: Modification - $500 each end of deployment
Loss of Use - $2500 each end of deployment

PART III

COPIES OF STUDENT HANDOUT MATERIAL AND GUIDANCE ON SPECIFIC EVENTS

31 August 19X2

FROM: 1st TFW (Commander)

SUBJ: Inflation

TO: 1st TFW (Deputy Commander for Resources)

Inflationary pressures have pushed the acquisition cost of new Regulators up to $2200--a net increase of $200 each, effective immediately. Assuming our initial purchase of new Regulators was properly planned, I expect this price increase to have no immediate effect on our budget.

S. O'BRIAN, Colonel, USAF
Commander

31 August 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Flying Hour Program During Deployment

TO: 1st TFW (Deputy Commander for Maintenance)

1. You asked to be advised of the flying hour program, by base, during the deployment of the 1st TFW in Zagruvia. As you know, the planned flying hours for the Wing are 1,800 per month. The locations of the squadrons and their operational zones will necessitate an uneven balance between the operational commitments of the squadrons. This, in turn, may necessitate the interchange of squadrons from time to time.

2. Each squadron is committed to fly the same number of operational sorties and, based on this requirement, the following flying hour program is expected to be maintained:

101/102 Squadrons, ZAB	1000 hours per month
103 Squadron, LAB	800 hours per month

3. The lower (average) flying hour program for the 101st and 102nd Squadrons is compensated by their commitment to stand by for defense of Zagruvian City.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

31 August 19X2 - FLYING HOUR PROGRAM

Teams should recognize that the flying hours per base will be different because of the different lengths of the sorties. If they request this information, they should be given this handout.

INFLATION

Teams should have checked the WRSK for completeness before deploying. Now, when the shortage is eventually discovered, the price will be higher in addition to the expedited maintenance caused.

15 September 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 September 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	5
103rd Squadron, LAB	Not Yet Operational

15 September 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 September 19X2

TO DC/M

Reparables:	5
NRTS:	0

FAILURES (QB):

Failures are posted in the total column of the Failure Summary. Any reparables generated this period are posted as Reparables with the remainder being NRTS. These reparables are now to be posted as On-Hand Reparables for the current period. The DC/M can now repair these within the FMS (Basc Repair).

If they are repaired routinely, they must be recorded on the right-hand side of the slash mark for the two periods hence; if expedited, on the left-hand side of the slash mark for the next period. Follow this procedure in succeeding periods.

30 September 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Wing Operations Record, September 19X2

TO: 1st TFW (Deputy Commander for Maintenance)

In response to your query, the Wing Operations Record for September 19X2 is as follows:

Organization	Flying Hours	Sorties
101/102 Sqdns, ZAB	990	610
103rd Sqdn, LAB	380	150

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

30 September 19X2 - FLYING HOUR PROGRAM

Provide this information if requested. Realistically, D/C Operations should provide this information to the Deputy Commander for Maintenance. Realistically, too, this is sometimes overlooked. This does not excuse the Deputy Commander for Maintenance from requesting it. Indeed, it emphasizes the interrelationship of decision making that the simulation seeks to demonstrate.

A copy is available for the Deputy Commander for Resources.

30 September 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-30 September 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	5
103rd Squadron, LAB	4

30 September 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 16-30 September 19X2

TO DC/M

Reparables:	8
NRTS:	1

15 October 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Redeployment of 'A' Flight, 101st Squadron

TO: 1st TFW (Deputy Commander for Maintenance)

1. 103rd Squadron is experiencing difficulties in meeting its operational commitment and we have decided to move the 6 aircraft of 'A' Flight, 101st Squadron to Lauckz Air Base to supplement the 103rd Squadron.

2. We anticipate these additional aircraft will enable the 103rd Squadron to meet its commitment. The operational commitment for the 101st Squadron has not been changed.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

15 October 19X2 - REDEPLOYMENT OF 'A' FLIGHT, 101st SQDN

If examined carefully, it will be seen that this redeployment will not affect Regulator usage. If not recognized, it may cause some maldistribution.

A copy is available for the Deputy Commander for Resources.

15 October 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 October 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	4
103rd Squadron, LAB	5

15 October 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 October 19X2

TO: DC/M

Reparables:	8
NRTS:	1

31 October 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 October 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	7

31 October 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 16-31 October 19X2

TO: DC/M

Reparables:	9
NRTS:	1

31 October 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Wing Operations Record, October 19X2

TO: 1st TFW (Deputy Commander for Maintenance)

In response to your query, the Wing Operations Record for October was as follows:

Organization	Flying Hours	Sorties
101/102 Sqdns, ZAB	1,003	608
103rd Sqdn, LAB	788	310

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

31 October 19X2 - FLYING HOUR PROGRAM

Provide as requested. Note that students can receive verbal indications of flying hours "before the fact" from the ED.

31 October 19X2

FROM: 103rd Squadron (Maintenance Officer)

SUBJ: Contaminated Pressure Regulators

TO: 1st TFW (Deputy Commander for Maintenance)

1. Pilots are reporting several incidents of toxic fumes entering the cockpit when aircraft are being run-up immediately prior to take-off. Although the fumes dissipate at altitude, they are extremely unpleasant and possibly hazardous when awaiting take-off and initial climb. It is apparent the fumes emanate from the Pressure Regulators.

2. Upon examination, we have found that the only regulators giving off these toxic fumes are those installed by maintenance personnel as replacements for failures in Zagruvia. These Regulators have apparently been coated with a protective paint which, under high outside temperature, gives off obnoxious fumes.

3. We have been able to remove this protective coating, but you should be aware of this problem for corrective action.

N. M. E. AGENT, Captain, USAF
Maintenance Officer

Cy to: DC/R

31 October 19X2 - CONTAMINATED PRESSURE REGULATORS

Situation: The mission capability of aircraft is being impaired due to the noxious fumes. No missions have been aborted to date because of this. Cause: Repair personnel in the FMS are misreading the Technical Order pertaining to coating of Regulators. As a result, the wrong coating is being applied. Impact: None so far. But unless immediate corrective action is taken (addressed to the "cause"), a PMCS condition will occur next period. Cost to correct: $500.

15 November 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 November 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	5
103rd Squadron, LAB	3

15 November 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 November 19X2

TO: DC/M

Reparables:	8
NRTS:	0

15 November 19X2

FROM: 103rd Squadron (Commander)

SUBJ: Contaminated Pressure Regulators

TO: 1st TFW (Deputy Commander for Maintenance)

1. We are still receiving defective regulators which have been determined to be incorrectly coated. To avoid being nauseated, aircrew members are forced to use an excessive amount of 100% oxygen from their aircraft's supply.

2. As a result, all aircraft in this squadron have been declared PMCS; maximum operational ceiling has been lowered to 15,000 feet. Unless this situation is corrected soon, I anticipate further degradation of our operational capability.

KURT REMARQUE, Major, USAF
Commander

NOTE: This PMCS condition entails a penalty of $1000.

15 November 19X2 - CONTAMINATED PRESSURE REGULATORS

Use this handout ONLY if the problem was not corrected previously. Note the PMCS penalty of $1000. Cost to correct: $750.

30 November 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-30 November 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	4
103rd Squadron, LAB	4*

*Reduce by one if contamination problem previously solved.

30 November 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 16-30 November 19X2

TO: DC/M

Reparables:	7*
NRTS:	1

*Reduce by one if contamination problem previously solved.

30 November 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Wing Operations Record, November 19X2

TO: 1st TFW (Deputy Commander for Maintenance)

1. In response to your query, the Wing Operations Record for November was as follows:

Organization	Flying Hours	Sorties
101/102 Sqdns., ZAB	991	609
103rd Sqdn., LAB	792	310

2. For the next two weeks, we expect very heavy rainstorms of a seasonal nature. AGGRESSOR activity is almost certain to slow considerably as a result. Consequently, we can expect flying hours to be reduced by approximately 50% for the aforementioned period.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

30 November 19X2 - FLYING HOUR PROGRAM

Provide automatically. Note the reduced flying hours will require reduced stock levels.

30 November 19X2

FROM: 1st TFW (Commander)

SUBJ: Contaminated Pressure Regulators

TO: 1st TFW (Deputy Commander for Maintenance)

1. Due to what was subsequently determined to be a contaminated Regulator, one sortie from the 103rd had to be aborted for safety reasons. The Regulator was declared reparable. This was over and above the normal failure rate.

2. All aircraft in the Wing have now been declared PMCS. FMS personnel are obviously using the wrong procedure for coating Regulators. Why hasn't this been corrected?

S. O'BRIAN, Colonel, USAF
Commander

NOTE: This PMCS penalty is $3000.

30 November 19X2 - CONTAMINATED PRESSURE REGULATORS

Use this handout ONLY if the problem was not previously corrected. Insist on a solution. Note the PMCS penalty of $3000. If corrected earlier, reduce failures by 1 in the 103rd. Cost to repair: $1000.

10 December 19X2

FROM: 103rd Squadron (Maintenance Officer)

SUBJ: In-Flight Failure of Regulators

TO: 1st TFW (Chief, Field Maintenance Squadron)

1. During the last week this organization experienced two in-flight Regulator failures. When these Regulators were tested on the flight-line, they checked out in accordance with technical specifications. They were again tested on a training mission and again they failed in flight. We can find no fault with these Regulators, but they are being sent to FMS for testing.

2. Our total failures for this period must be increased by the two we are now sending you.

3. Please advise us of what action must be taken to avoid a recurrence of these incidents.

N.M.E. AGENT, Captain, USAF
Maintenance Officer

14 December 19X2

FROM: 1st TFW (Chief, Field Maintenance Squadron)

SUBJ: In-Flight Failure of Regulators

TO: 1st TFW (Deputy Commander for Maintenance)

1. You will have received notification from the Maintenance Officer of the 103rd Squadron of the in-flight failures of Regulators that, when tested on the ground, checked out satisfactory.

2. We subjected these Regulators to strict test procedures, and as the 103rd Squadron found, they passed all technical requirements. We then asked the 101st Squadron to test them in flight and again they failed.

3. After extensive examination of the Regulators, it was determined that the in-flight failures were caused by icing conditions in the severe weather currently being experienced. We installed filters to absorb the excessive moisture and the modified regulator passed in-flight tests. The modified Regulators have been sent to Wing Supply as serviceable assets.

HAL. O. TOSIS, Lieutenant Colonel, USAF Cy to: OIC/FMS
Officer in Charge, Field Maintenance Squadron

14 December 19X2 - IN-FLIGHT FAILURE OF REGULATORS

This type of problem indicates that the Regulators have not been designed to operate in high humidity areas such as Zagruvia. Condensation at high altitude is causing Regulators to freeze up, thus becoming inoperative. All Regulators on station in stock and currently installed on assigned aircraft lack this capability.

The proper corrective action is to install a filter in the Regulator to absorb the moisture and prevent the valves in the Regulator from freezing up. The Regulators should be properly tested on the ground under similar altitudinal conditions. This minor modification will cost $750 in material and maintenance. The modification must be coordinated with Item Managers and/or the contractor.

Failure to take corrective action will cause more aborts in future periods and higher failure rates. If necessary, the ED should prompt teams to ensure any "fix" is a permanent one.

15 December 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 December 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	2
103rd Squadron, LAB	4*

*Includes two caused by in-flight failure.

15 December 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 December 19X2

TO: DC/M

Reparables:	4
NRTS:	0

15 December 19X2

FROM: 1st TFW (Chief, Field Maintenance Squadron)

SUBJ: Sabotage of the Queen Bee

TO: 1st TFW (Deputy Commander for Maintenance)

1. When arriving for duty early this morning, operating personnel discovered much of our repair equipment had been sabotaged. The incident is currently under investigation by the OSI. I estimate our repair capability will be eliminated for six (6) weeks.

2. After discussing the situation with the F-222 System Manager at XY-ALC, it appears there are several courses of action open to us. First of all, we can return all reparables to the TRC--indeed, this is the only repair alternative open to us. Repair cost would be $1500 per Regulator and would require 14 days; expedited shipping costs $200, each way, and also requires 14 days (each way). As an alternative to the latter, a special contract airlift is being made available at a cost of $500 providing one-half day shipping time (each way). This contract airlift may be used by itself or in conjunction with the normal (expedited) shipment mode. Since Regulators sent to the TRC under these conditions will be returned to us, the credit of $500 per Regulator will not apply.

3. Also, the System Manager has made available to us the services of a Combat Logistics Support Squadron (CLSS). For a total cost of $7500, the CLSS will have our FMS facility serviceable again in two weeks instead of six.

4. We need to ensure, of course, whatever action we take will result in maintaining our operational posture, with respect to budgetary constraints. My initial discussion with the HQ TAC Comptroller indicates additional funds are not available at this time.

HAL O. TOSIS, Lieutenant Colonel, USAF
Officer in Charge, Field Maintenance Squadron

15 December 19X2 - SABOTAGE OF THE FMS REPAIR FACILITY

This handout puts the Queen Bee out of action immediately. Anything due out of repair this period will be received as a serviceable; anything due out of repair next period from the QB should be added to those reparables shown for this period.

A Queen Bee team should, of course, start sending reparables back to the TRC.

The TRC should be able to repair all those sent back --no NRTS, no capacity limitation. Indicate the return of these reparables to the Wing by recording them in the CONUS column in the appropriate period, depending upon how they are shipped. Record the transportation and maintenance costs when the reparables are sent to the TRC.

Any reparables sent to the TRC this period would be back in the Wing by 31 January if shipped normally (expedite) or 31 December if special (contract). "Splitting" the shipment mode makes serviceables available on 15 January.

This repair facility is available every period.

If a team submitted an original budget below $110,000, it may feel justified in requesting additional funds despite the statement in the handout.

31 December 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 December 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	5
103rd Squadron, LAB	4

31 December 19X2

SUBJECT: Bench Check Report of Reparables

PERIOD: 16-31 December 19X2

TO: DC/M

Reparables:	7
NRTS:	2

15 January 19X3

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Amendments to Operational Plan

TO: 1st TFW (Deputy Commander for Maintenance)

1. Intelligence reports heavy troop movements by AGRESSOR forces continue in Operational Zone II. Accordingly, we have decided to continue with a show of force throughout this Zone.

2. To implement this decision, the following operational commitment changes will be made immediately:

   a. 'A' Flight, 101st Squadron, will return to ZAB.

   b. 102nd Squadron will fly 15 sorties a day in Zone II.

   c. 101st Squadron will fly 5 sorties a day in Zone I.

   d. 101st Squadron will increase its sortie rate in Zone II to 5 sorties a day.

   e. 103rd Squadron will continue to meet its operational commitment without the assistance of 'A' Flight, 101st Squadron.

4. These changes will stay in effect for only two weeks.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

15 January 19X3 - CHANGE IN DEPLOYMENT

This will change the flying hours in 101st/102nd Squadrons and should change safety levels at these squadrons.

A copy is available for the Deputy Commander for Resources.

IF REQUESTED, the Deputy Commander for Operations can provide the following flying hour program:

101st/102nd Squadrons	1400 hours
103rd Squadron	800 hours

This increased flying may prompt the submission of another supplementary Budget. Try and get good justification from the Comptroller.

15 January 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 January 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	6
103rd Squadron, LAB	3

15 January 19X3

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 January 19X3

TO: DC/M

Reparables:	8
NRTS:	1

31 January 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 January 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	10
103rd Squadron, LAB	2

31 January 19X3

SUBJECT: Bench Check Report of Reparables

PERIOD: 16-31 January 19X3

TO: DC/M

Reparables:	11
NRTS:	1

15 February 19X3

FROM: 1st TFW (Commander)

SUBJ: Exercise "EMPEROR"

TO: 1st TFW (Deputy Commander for Maintenance)

1. The Ides of March is a national holiday in Zagruvia and, to assist in the celebration, all squadrons of the 1st TFW will fly in formation over the Capitol and the Zagruvian President will take the salute.

2. It is essential all aircraft participate in this Fly-By and you are to ensure logistic support to meet this requirement. There have been some logistic problems recently which I believe should have been resolved by now. Please give me a briefing on these problems and the action taken to avoid their repetition.

S. O'BRIAN, Colonel, USAF
Commander

Cy to: DC/R

NOTE: To emphasize possible "loss-of-face" if any aircraft fail to participate, a NMCS in this period will incur a penalty of $10,000.

15 February 19X3 - FLY-BY

Note the increased penalty for a NMCS. This gives a team advance warning of the Fly-By. The Ides of March is 15 March.

A copy is available for the Deputy Commander for Resources.

15 February 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 February 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	3

15 February 19X3

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 February 19X3

TO: DC/M

Reparables:	6
NRTS:	0

28 February 19X3

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Commitment Phase Out

TO: 1st TFW (Deputy Commander for Maintenance)

1. Troop movements on the frontier by AGRESSOR forces have been reduced substantially in the last 10 days. The Zagruvian government considers that invasion plans have diminished appreciably and, in recognition of the agreement to release the 1st TFW from this commitment within 6 months of its deployment, it has been agreed, mutually, that all squadrons will be phased out of the theatre during the next 6 weeks.

2. The phased return of the squadrons to CONUS is as follows:

   a. 103rd Squadron - last day of operations is 31 March, returning to CONUS during the period 1-7 April.

   b. 101st/102nd Squadrons - last day of operations is 15 April, returning to CONUS during the period 16-23 April.

3. Operational sortie rates for all squadrons are reduced by 25% for the remaining period of operations. but you should recognize that all squadrons will be practicing for the Fly-By. Consequently, it is difficult to predict the flying hours for the next two weeks.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

28 February 19X3

This gives the redeployment dates for the Squadrons. Mark the chart accordingly.

A copy is available for the Deputy Commander for Resources.

28 February 19X3

FROM: 1st TFW (OIC, Field Maintenance Squadron)

SUBJ: Return of Support Equipment to CONUS

TO: 1st TFW (Deputy Commander for Maintenance)

1. With the planned return of the Wing to CONUS, all OMS repair will cease at ZAB on 31 March. At that time, the Support Equipment will be converted to 110V 60 cycle and, subsequently, returned to CONUS.

2. Your financial records should reflect $500 for the conversion and $5,000 for the transportation.

HAL O. TOSIS, Lieutenant Colonel, USAF
Officer in Charge

28 February 19X3 - PHASE OUT OF FMS

Use this handout only for teams which are "Queen Bee." Costs must be adjusted--$500 for conversion plus $2,500 for "loss-of-use" (debited to Maintenance) and $5,000 for Transportation if you did not record these costs at the beginning of the simulation.

There will be no repair at the Wing after 31 March.

28 February 19X3

TWX 28 FEBRUARY 19X3 TO 1ST TFW FOR ATTENTION OF DC/R FROM DCS/LOGISTICS HQ TAC REFERENCE RETURN OF SURPLUS REGULATORS. EACH SQUADRON MUST TAKE WITH IT 3 SERVICEABLE REGULATORS ON ITS RETURN TO CONUS. FAILURE TO MEET THIS REQUIREMENT WILL NECESSITATE EXCESSIVE REQUISITIONING ON XYALC AND THIS COST MUST BE ABSORBED BY YOU.

28 February 19X3 - RETURN OF STOCK (QB)

When each squadron returns, 3 serviceable Regulators must be sent back with it. These Regulators can come from anywhere in the system. Adjust the records as necessary. Debit requisitioning costs of $2,000 for each Regulator below this quantity not returned.

28 February 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-28 February 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	5
103rd Squadron, LAB	4

28 February 19X3

SUBJECT: Bench Check Report of Reparables

PERIOD: 16-28 February 19X3

TO: DC/M

Reparables:	7
NRTS:	2

15 March 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 March 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	3

15 March 19X3

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 March 19X3

TO: DC/M

Reparables:	6
NRTS:	0

31 March 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 March 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	4

31 March 19X3

SUBJECT: Bench Check Report of Reparables

PERIOD: 16-31 March 19X3

TO: DC/M

Reparables:	6
NRTS:	1

15 April 19X3

TWX 15 APR 19X3 TO 1ST TFW FOR ATTENTION DC/M FROM DCS/ LOGISTICS HQ TAC REFERENCE RETURN OF REPARABLE REGULATORS. OUR RECORDS SHOW THAT YOU ARE HOLDING REPARABLE REGULATORS THAT CANNOT BE REPAIRED IN ZAGRUVIA. THIS WILL CAUSE EXPEDITED REPAIR BY THE TRC TO MAINTAIN LOGISTIC SUPPORT WHEN THE WING RETURNS TO CONUS. YOU ARE TO RETURN IMMEDIATELY ALL REPARABLES THAT ARE NOT BEING REPAIRED IN COUNTRY. BECAUSE OF THE ADDITIONAL COST TO REPAIR THESE REPARABLES THE NORMAL $500 A UNIT CREDIT WILL NOT BE APPLIED.

15 April 19X3 - TWX TO DEPUTY COMMANDER FOR MAINTENANCE (QB)

If a team is holding reparables that are not being repaired, those reparables must now be returned to CONUS and NO credit of $500 will be given.

No credit must be given for reparables returned this period or subsequent periods.

15 April 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 April 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	4
103rd Squadron, LAB	-

15 April 19X3

SUBJECT: Bench Check Report of Reparables

PERIOD: 1-15 April 19X3

TO: DC/M

Reparables:	3
NRTS:	1

15 April 19X3

FROM: 1st TFW (Commander)

SUBJ: Assignment to School of Systems and Logistics, 1st TFW

TO: 1st TFW (Deputy Commander for Resources)

1. On conclusion of our deployment to Zagruvia, I have arranged that you will attend the next offering of the Logistics Management Course (LOG 224) at the School of Systems and Logistics, Wright-Patterson AFB.

2. Since there are other members on your staff who would benefit from this course, please provide their names to me.

S. O'BRIAN, Colonel, USAF
Commander

15 April 19X3

FROM: 1st TFW (Commander)

SUBJ: Letter of Commendation

TO: 1st TFW (Deputy Commander for Resources)

1. As we near the conclusion of our current MADO commitments to Zagruvia, I want to commend you and your staff for a job done in the best traditions of the Service and the Wing. There were times when I was somewhat concerned whether the logistics support would enable the Wing to meet its operational obligations, but notwithstanding the many problems, you kept us flying.

2. Please convey my appreciation to all concerned.

S. O'BRIAN, Colonel, USAF
Commander

15 April 19X3 - LETTER OF COMMENDATION-ASSIGNMENT

Give one or the other (or both) to the Deputy Commander for Maintenance and the Deputy Commander for Resources.

LOG-PLAN-X

DATE ____________ CLASS __________ TEAM ________ VERSION _________

REQNS. _______________

TRANSP. _______________

MAINT. _______________

NMCS _______________

MISC. _______________

BUD. ADJ. __________

TOTAL ==========

CREDIT FOR
RETURN OF
REPARABLES __________

BONUS FOR
BUDGET __________

NET SCORE __________

1ST TFW MAINT PLAN:

QB __________

RIW __________

CONTAMINATION

0 1

ABORTED IN-FLIGHTS

0 2 4

NMCS

REG __________

FLY-BY ________

TOTAL ________

SCORE SHEET

Complete this cost sheet at the end of the game. Circle the appropriate number on the sheet to indicate when the problems were corrected--the 1st, 2nd, or 3rd time they occurred.

DATE________________

FROM: 1st TFW (Commander)

SUBJ: Not Mission Capable Aircraft

TO: 1st TFW (Deputy Commander for Resources)

1. It has been reported to me the following NMCS conditions occurred during the last two weeks:

_______Squadron: ______Aircraft NMCS for _____Regulators

_______Squadron: ______Aircraft NMCS for _____Regulators

2. I require a briefing as soon as possible as to the cause, corrective action, and firm get-well date.

S. O'BRIAN, Colonel USAF
Commander

NMCS SITUATION

Copies of this handout will be given to each Exercise Director to be completed and used on every occasion of a NMCS.

A team should recognize there are 2 Regulators per aircraft and, if they are unfortunate enough to experience a shortage of 2 Regulators on one Base during a single period, then a cannibalization policy should be implemented and only one aircraft would be grounded. There will be a cost of $500 for each cannibalization, making a NMCS cost $8,000 per aircraft instead of $15,000 for two aircraft.

FROM: 1st TFW (Chief, Wing Supply)

SUBJ: Regulator Discrepancy

TO: 1st TFW (Deputy Commander for Resources)
1st TFW (Deputy Commander for Maintenance)
IN TURN

1. When attempting to issue Regulators from Wing Supply this period, we discovered the actual on-hand balance did not agree with supply records.

2. After an inventory was taken, the total shortage was determined to be two. Supply records have been adjusted to reflect this fact. This condition apparently existed before our deployment.

JUSTIN TYME, SMS, USAF
NCOIC, Wing Supply

SHORT WRSK

The WRSK is short by two regulators even before deploying. If teams checked this fact before deploying, this would allow acquisition of replacements beforehand. (In such case, the letter will not be needed.)

If teams did not check the WRSK before deployment, the letter will be used the first time the team tries to reduce the Wing inventory to "one" or "zero."

PART IV - CRITIQUING

In order to increase the learning outcome of playing LOG-PLAN-X and to make the critque more meaningful, we suggest when you critique the play of your team, you highlight the following management areas of decision-making, rather than comment upon specific actions relating to specific events.

1. Stock-Level Policies

   What were they?
   Were they reviewed?
   Were they changed?
   Were they followed?

2. Management Philosophy

   Did the team have a management philosophy?
   Was it a stated philosophy and if so, was it maintained?
   Was it noticeable?

3. Budget Computations

   What methodology was used?

4. Unique Decisions

   Were there any unusual decisions?

5. Communications

   Did the team establish communications with DC/OPS and others and among themselves?

APPENDIX C

EXERCISE DIRECTOR'S NOTES

(RIW)

The success of any simulation exercise, in terms of achieving the learning objectives, is directly related to the participation of the students and the competency of the Exercise Director. It is the responsibility of the Exercise Director to obtain active student participation and to maintain a rapport with the students throughout the play of the game. He should not only act as a referee, but he should use the simulation as a teaching device--if necessary, stopping the game and discussing with the team policies, objectives, etc.

These Exercise Director's Notes are provided for your guidance and as an aide memoire and are not intended to be dogma. This is your personal copy of the Notes, and you are encouraged to develop your guidance notes to assist you in directing the exercise. You will find a few blank pages at the end of each Part for this purpose. If you come across any quirk in the program which should be brought to the attention of other Exercise Directors, please note this and ensure that all other Exercise Directors are informed.

These notes have been written on the premise that you have some detailed knowledge of the play of the game. If you doubt your ability to direct a game, the most effective way to learn the game in detail is to play it by yourself two or three times, scoring on the small score sheets.

An important feature both in directing the simulation and the actual play of the exercise is role-playing. Students are expected to assume a role and to play that role realistically. It is equally important that the Exercise Director also assumes roles the students want him to play and responds to the students' questions as he would in real life. He should do this very early in the game--preferably in the planning phase--so students understand the degree of realism expected.

These notes are in the following Parts:

Part I - Determining the Maintenance Plan and Budget

Part II - Cost Charts

Part III - Copy of Handout Material

Part IV - Evaluation and Critique

PART I

BASIS FOR MAINTENANCE PLAN AND BUDGET REQUEST

The following are copies of slides that will be used in the critique to explain to students one simple method in determining costs in evaluating the two major maintenance plans. All transportation costs are calculated on expedited shipments because this is the least costly way to save two weeks of pipeline time.

From this type of cost analysis, it should be possible to arrive at a realistic budget. To encourage teams to submit budgets that are realistic, a $1000 bonus may be awarded to a team that submits a budget that does not exceed $112,000.

A team that submits a budget in excess of these figures will be penalized 10% of the amount in excess. For example, if a team submits a budget of $150,000, this would be $38,000 in excess of $112,000 and a penalty of $3,800 would be imposed.

The Maximum Budget That Will Be Given is $118,000.

LOG-PLAN-X

REQUIREMENTS COMPUTATION FORMULA

GROSS REQUIREMENTS	=	Total Repair Pipeline + Stock Level + (if Queen Bee) NRTS + (if RIW) Initial Aircraft exchange
TOTAL REPAIR LINE	=	Failures any one Period + Reparables Due In from Repair Next Period
STOCK LEVEL	=	Safety Level at Each Base + Average Expected Usage
NRTS	=	(Queen Bee only) Those that Cannot Be Repaired in Zagruvia Because of Capability (10% NRTS Rate)
NET REQUIREMENT (QB)	=	Gross Requirement - WRSK Kit on-hand
NET REQUIREMENT (RIW)	=	Gross Requirement + new WRSK Kit required

LOG-PLAN-X

REQUIREMENT COMPUTATION

		RIW
TOTAL REPAIR PIPELINE:	Failures any one period	4.5
	Due in from Repair	13.5
	TOTAL	18.0
STOCK LEVEL:	Safety Level	5.5
	Expected Usage	4.5
	TOTAL	10.0
INITIAL:	Initial Exchange	120

GROSS REQUIREMENT: 18 + 10 + 120 = 148

NET REQUIREMENT: 148 + 18* = 166

*2 months supply: (1800 flying hrs. ÷ 200 hrs MTBF x 2 mos) = 18

LOG-PLAN-X

PROJECTED COSTS - RIW ONLY

REQUISITION:	166 x $700 = $116,200		
	Less: 156 x $190 = <29,640>		
			$86,560
TRANSPORTATION:			
CONUS-Zagruvia:	4.5 x 14 x $200 (Expedited)	= $12,600	
Intra-Theatre:	2 per period @ $100	= 2,600	
		TOTAL	$15,200
MAINTENANCE: (none)			0
		TOTAL COST	*$101,760*

INITIAL STOCK LEVELS

Total Flying Hours → 1800/month

	100 Hrs. Avg.Usg./ 95% C.L.	167 Hrs. Avg.Usg./ 95% C.L.	200 Hrs. Avg.Usg./ 95% C.L.
101st/102nd Squadrons	5/9	3/6	2.5/5
103rd Squadron	4/7	2.4/5	2/5

NOTE: These are "per period" figures.

PART II

COST, TIME AND CAPACITY CHARTS (RIW)

NOTE: This type of chart has, deliberately, not been given to students. A well-organized student Team should produce their own chart.

1. Requisitions: Cost = \$700 each (net chargeable against this deployment)
Prod. Time = 6 weeks
Capacity = 16 every 14 days (initial purchase unlimited)

2. Shipping:

CONUS ZAGRUVIA

Cost		Time	
R	EX	R	EX
\$50	\$200	28 days	14 days

INTRA-THEATRE

Cost		Time	
R	EX	R	EX
\$50	\$100	16 days	1 day

All shipments are made at the end of a period.

Shipments to 101/102 Sqdns will arrive in 1 day without cost.

3. <u>Repair</u>, RIW Option

<u>Contractor Plant</u>

Cost		Time		Capacity
R	EX	R	EX	
-0-	-0-	14 days	n/a	Unlimited

PART III

COPIES OF STUDENT HANDOUT MATERIAL AND GUIDANCE ON SPECIFIC EVENTS

31 August 19X2

FROM: 1st TFW (Commander)

SUBJ: Inflation

TO: 1st TFW (Deputy Commander for Resources)

Inflationary pressures have pushed the acquisition cost of new Regulators up to a net of $800--a net increase of $100 each, effective immediately. Assuming our initial purchase of new Regulators was properly planned, I expect this price increase to have no immediate effect on our budget.

S. O'BRIAN, Colonel, USAF
Commander

31 August 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Flying Hour Program During Deployment

TO: 1st TFW (Deputy Commander for Maintenance)

1. You asked to be advised of the flying hour program, by base, during the deployment of the 1st TFW in Zagruvia. As you know, the planned flying hours for the Wing are 1,800 per month. The locations of the squadrons and their operational zones will necessitate an uneven balance between the operational commitments of the squadrons. This, in turn, may necessitate the interchange of squadrons from time to time.

2. Each squadron is committed to fly the same number of operational sorties and, based on this requirement, the following flying hour program is expected to be maintained:

101/102 Squadrons, ZAB	1000 hours per month
103 Squadron, LAB	800 hours per month

3. The lower (average) flying hour program for the 101st and 102nd Squadrons is compensated by their commitment to stand by for defense of Zagruvian City.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

31 August 19X2 - FLYING HOUR PROGRAM

Teams should recognize that the flying hours per squadron will be different because of the different lengths of the sorties. If they request this information, they should be given this handout.

INFLATION

With this handout, inflation rears its ugly head. All future regulator purchases will be costed as stated.

15 September 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 September 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	Not Yet Operational

FAILURES (RIW):

Failures are posted in the total column of the Failure Summary and also in the reparables column. These reparables are now to be posted as On-Hand Reparables for the current period. The DC/M can now ship these to CONUS for repair by the contractor. Note that the NRTS and Base Repair columns are not used.

If they are to be shipped routinely, they must be recorded on the right-hand side of the CONUS slash mark five periods hence; if expedited, on the left-hand side of the slash mark for two periods hence. Follow this procedure in succeeding periods.

30 September 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Wing Operations Record, September 19X2

TO: 1st TFW (Deputy Commander for Maintenance)

In response to your query, the Wing Operations Record for September 19X2 is as follows:

Organization	Flying Hours	Sorties
101/102 Sqdns, ZAB	990	610
103rd Sqdn, LAB	380	150

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

30 September 19X2 - FLYING HOUR PROGRAM

Provide this information if requested. Realistically, D/C Operations should provide this information to the Deputy Commander for Maintenance. Realistically, too, this is sometimes overlooked. This does not excuse the Deputy Commander for Maintenance from requesting it. Indeed, it emphasizes the interrelationship of decision making that the simulation seeks to demonstrate.

A copy is available for the Deputy Commander for Resources.

30 September 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-30 September 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	4
103rd Squadron, LAB	3

AD-A103 252 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL--ETC F/G 5/9
A COMPREHENSIVE REVISION OF THE LOGISTICS PLANNING EXFRCISE (LO--ETC(U)
JUN 81 J F HARRIS, R L NICKELSON
UNCLASSIFIED AFIT-LSSR-30-81 NL

3 OF 3

AD
A103252

END
DATE
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10-81
DTIC

15 October 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Redeployment of 'A' Flight, 101st Squadron

TO: 1st TFW (Deputy Commander for Maintenance)

1. 103rd Squadron is experiencing difficulties in meeting its operational commitment and we have decided to move the 6 aircraft of 'A' Flight, 101st Squadron to Lauckz Air Base to supplement the 103rd Squadron.

2. We anticipate these additional aircraft will enable the 103rd Squadron to meet its commitment. The operational commitment for the 101st Squadron has not been changed.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

15 October 19X2 - REDEPLOYMENT OF 'A' FLIGHT, 101st SQDN

If examined carefully, it will be seen that this redeployment will not affect Regulator usage. If not recognized, it may cause some maldistribution.

A copy is available for the Deputy Commander for Resources.

15 October 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 October 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	5
103rd Squadron, LAB	2

31 October 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Wing Operations Record, October 19X2

TO: 1st TFW (Deputy Commander for Maintenance)

In response to your query, the Wing Operations Record for October was as follows:

Organization	Flying Hours	Sorties
101/102 Sqdns, ZAB	1,003	608
103rd Sqdn, LAB	788	310

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

31 October 19X2 - FLYING HOUR PROGRAM

Provide as requested. Note that students can receive verbal indications of flying hours "before the fact" from the ED.

31 October 19X2

FROM: 1st TFW (Commander)

SUBJ: Strike at the Contractor's Plant

TO: 1st TFW (Deputy Commander for Maintenance)

1. I have confirmed the report of a machinists' strike at the contractor's plant due to a labor contract dispute. Although this strike will almost certainly not last over ten (10) days, the disruption caused by it will totally negate the contractor's repair capability for four (4) weeks. However, any Regulators scheduled out of repair this period have already been shipped to you. Other reparable Regulators in the contractor's possession will simply sit in his warehouse until the conclusion of the strike or unless we initiate some alternate repair action.

2. Our conversations with the F-222 System Manager at XY-ALC have been less than positive. I specifically requested a Depot Maintenance Team be sent to Zagruvia and set up maintenance facilities. He flatly stated that this was an impossibility since we lost our repair capability with the inception of the RIW. The only other alternative is returning the reparables to XY-ALC for further shipment to (and repair by) subcontractors who manufactured Regulators for the initial exchange; this will not void the warranty. No repair costs will be incurred; these will be borne by the contractor. However, total turnaround time is now lengthened to forty-four (44) days (shipping plus repair). These constraints also apply to reparables on hand at the contractor's plant.

3. This strike is confined to the repair aspect (only) of the contractor's facility. Employees involved with the manufacture of new regulators belong to a different "local;" however, these employees will not cross the picket line to operate the repair facility. Expedited purchase (net cost chargeable to deployment is $1,200) with special contract airlift ($500) will take a total of fourteen (14) days. Other purchase/shipping options remain as before.

4. Please ensure you take whatever action is necessary to maintain our operational posture while recognizing budgetary constraints.

S. O'BRIAN, Colonel, USAF
Commander

31 October 19X2 - STRIKE AT THE CONTRACTOR'S PLANT

This handout puts the contractor's repair facility out of action immediately. Anything due out of repair this period will be received normally; anything due out of repair next period from the contractor will simply sit in his warehouse awaiting repair.

Reparables may be sent back to the TRC for forwarding to subcontractors. Indicate the return of serviceable assets to the Wing by recording them in the CONUS column in the appropriate period, depending upon shipment option selected. Record the transportation costs when the reparables are sent through the TRC.

The quickest way to receive regulators will be the expedited purchase/contract airlift option at very high cost. The optimum solution will involve some sort of combination between purchasing and repair, depending, of course, on the current supply situation.

31 October 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 October 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	3

15 November 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 November 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	2
103rd Squadron, LAB	2

30 November 19X2

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Wing Operations Record, November 19X2

TO: 1st TFW (Deputy Commander for Maintenance)

1. In response to your query, the Wing Operations Record for November was as follows:

Organization	Flying Hours	Sorties
101/102 Sqdns., ZAB	991	609
103rd Sqdn., LAB	792	310

2. For the next two weeks, we expect very heavy rainstorms of a seasonal nature. AGGRESSOR activity is almost certain to slow considerably as a result. Consequently, we can expect flying hours to be reduced by approximately 50% for the aforementioned period.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

30 November 19X2 - FLYING HOUR PROGRAM

Provide automatically. Note the reduced flying hours will require reduced stock levels.

30 November 19X2

FROM: 1st TFW (Chief, Maintenance Analysis Branch)

SUBJ: Request for Special Action

TO: 1st TFW (Deputy Commander for Maintenance)

1. Per your request, available data collected to date indicates the initial 200 hour MTBF estimate to be substantially overstated--possibly by as much as 35 hours. Although our sample size (number of failures) for this deployment has been relatively small, indications are that the initial estimate was, in fact, erroneous.

2. Suggest this matter be monitored closely. In fact, it might be prudent to completely review our stock level policies.

X. O. VEREESSI, 1Lt, USAF
Chief, Maintenance Analysis Branch

30 November 19X2

Provide only to student teams realizing that the MTBF is much worse than 200 hours, and have directed an investigation. Immediate action will need to be taken to readjust stock levels with a supplementary budget.

30 November 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-30 November 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	3

15 December 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 December 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	6
103rd Squadron, LAB	2

31 December 19X2

FROM: 1st TFW (Commander)

SUBJ: MTBF of the Pressure Regulator

TO: 1st TFW (Deputy Commander for Maintenance)
1st TFW (Deputy Commander for Resources)
IN TURN

1. The item manager at XY-ALC has informed me that the initial MTBF estimate for our pressure regulator was seriously overstated. Rather than 200 hours, the MTBF should be 167 hours. Indeed, it appears we have been operating under the latter MTBF for the length of the deployment to date. Our failure rate will increase accordingly.

2. Immediate action must be taken to prevent a NMCS condition from occurring/recurring. Consequently, I will require the submission of a new budget plus details of your new stock level policy, if any. This problem should have been recognized sooner.

S. O'BRIAN, Colonel, USAF
Commander

31 December 19X2

A student team should be "zapped" with this letter ONLY if they have not taken corrective action before now.

31 December 19X2

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 December 19X2

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	3

15 January 19X3

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Amendments to Operational Plan

TO: 1st TFW (Deputy Commander for Maintenance)

1. Intelligence reports heavy troop movements by AGRESSOR forces continue in Operational Zone II. Accordingly, we have decided to continue with a show of force throughout this Zone.

2. To implement this decision, the following operational commitment changes will be made immediately:

   a. 'A' Flight, 101st Squadron, will return to ZAB.

   b. 102nd Squadron will fly 15 sorties a day in Zone II.

   c. 101st Squadron will fly 5 sorties a day in Zone I.

   d. 101st Squadron will increase its sortie rate in Zone II to 5 sorties a day.

   e. 103rd Squadron will continue to meet its operational commitment without the assistance of 'A' Flight, 101st Squadron.

4. These changes will stay in effect for only two weeks.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

15 January 19X3 - CHANGE IN DEPLOYMENT

This will change the flying hours in 101st/102nd Squadrons and should change safety levels at these squadrons.

A copy is available for the Deputy Commander for Resources.

IF REQUESTED, the Deputy Commander for Operations can provide the following flying hour program:

101st/102nd Squadrons	1400 hours
103rd Squadron	800 hours

This increased flying may prompt the submission of another supplementary Budget. Try and get good justification from the Comptroller.

15 January 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 January 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	2
103rd Squadron, LAB	1

31 January 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 January 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	5
103rd Squadron, LAB	2

15 February 19X3

FROM: 1st TFW (Commander)

SUBJ: Exercise "EMPEROR"

TO: 1st TFW (Deputy Commander for Maintenance)

1. The Ides of March is a national holiday in Zagruvia and, to assist in the celebration, all squadrons of the 1st TFW will fly in formation over the Capitol and the Zagruvian President will take the salute.

2. It is essential all aircraft participate in this Fly-By and you are to ensure logistic support will meet this requirement. There have been some logistic problems recently which I believe should have been resolved by now. Please give me a briefing on these problems and the action taken to avoid their repetition.

3. Effective 1 March, the 103rd Squadron will be moved to ZAB for this Fly-By. The squadron will be back in place at LAB on 15 March.

S. O'BRIAN, Colonel, USAF
Commander

Cy to: DC/R

NOTE: To emphasize possible "loss-of-face" if any aircraft fail to participate, a NMCS in this period will incur a penalty of $10,000.

15 February 19X3

Note the increased penalty for a NMCS. This gives a team advance warning of the Fly-By. The Ides of March is 15 March.

A copy is available for the Deputy Commander for Resources.

Teams should note the movement of the 103rd Squadron to ZAB and plan stock levels accordingly. Proper planning here will minimize shipment of regulators from LAB to ZAB (chargeable at the $100 expedite rate) then back again at the conclusion of the Fly-By.

15 February 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 February 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	2
103rd Squadron, LAB	3

28 February 19X3

FROM: 1st TFW (Deputy Commander for Operations)

SUBJ: Commitment Phase Out

TO: 1st TFW (Deputy Commander for Maintenance)

1. Troop movements on the frontier by AGRESSOR forces have been reduced substantially in the last 10 days. The Zagruvian government considers that invasion plans have diminished appreciably and, in recognition of the agreement to release the 1st TFW from this commitment within 6 months of its deployment, it has been agreed, mutually, that all squadrons will be phased out of the theatre during the next 6 weeks.

2. The phased return of the squadrons to CONUS is as follows:

   a. 103rd Squadron - last day of operations is 31 March, returning to CONUS during the period 1-7 April.

   b. 101st/102nd Squadrons - last day of operations is 15 April, returning to CONUS during the period 16-23 April.

3. Operational sortie rates for all squadrons are reduced by 25% for the remaining period of operations. but you should recognize that all squadrons will be practicing for the Fly-By. Consequently, it is difficult to predict the flying hours for the next two weeks.

BEN D. RULES, Colonel, USAF
Deputy Commander for Operations

Cy to: DC/R

28 February 19X3

This gives the redeployment dates for the Squadrons. Mark the chart accordingly.

A copy is available for the Deputy Commander for Resources.

28 February 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-28 February 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	2

15 March 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 March, 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	2
103rd Squadron, LAB	0

31 March 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 16-31 March 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	2
103rd Squadron, LAB	2

15 April 19X3

FROM: 1st TFW (Commander)

SUBJ: Letter of Commendation

TO: 1st TFW (Deputy Commander for Resources)

1. As we near the conclusion of our current MADO commitments to Zagruvia, I want to commend you and your staff for a job done in the best traditions of the Service and the Wing. There were times when I was somewhat concerned whether the logistics support would enable the Wing to meet its operational obligations, but notwithstanding the many problems, you kept us flying.

2. Please convey my appreciation to all concerned.

S. O'BRIAN, Colonel, USAF
Commander

15 April 19X3 - LETTER OF COMMENDATION-ASSIGNMENT

Give one or the other (or both) to the Deputy Commander for Maintenance and the Deputy Commander for Resources.

15 April 19X3

SUBJECT: Bi-Weekly Report on Regulator Failures

PERIOD: 1-15 April 19X3

TO: DC/R

FAILURES:

101/102 Squadrons, ZAB	3
103rd Squadron, LAB	-

15 April 19X3

FROM: 1st TFW (Commander)

SUBJ: Assignment to School of Systems and Logistics, 1st TFW

TO: 1st TFW (Deputy Commander for Resources)

1. On conclusion of our deployment to Zagruvia, I have arranged that you will attend the next offering of the Logistics Management Course (LOG 224) at the School of Systems and Logistics, Wright-Patterson AFB.

2. Since there are other members on your staff who would benefit from this course, please provide their names to me.

S. O'BRIAN, Colonel, USAF
Commander

LOG-PLAN-X

DATE____________CLASS____________TEAM__________VERSION__________

REQNS. __________________

TRANSP. __________________

MAINT. __________________

NMCS __________________

MISC. __________________

BUD. ADJ. __________________

TOTAL __________________

CREDIT FOR
RETURN OF
REPARABLES
(N/A FOR RIW) __________

BONUS FOR BUDGET ________

NET SCORE ______________

<u>1ST TFW MAINT PLAN</u>:

QB__________

RIW__________

<u>CAL</u>

1 2 3

<u>NMCS</u>

REG__________

FLY-BY__________

TOTAL__________

SCORE SHEET

Complete this cost sheet at the end of the game. Circle the appropriate number on the sheet to indicate when the problems were corrected--the 1st, 2nd, or 3rd time they occurred.

DATE ________________

FROM: 1st TFW (Commander)

SUBJ: Not Mission Capable Aircraft

TO: 1st TFW (Deputy Commander for Resources)

1. It has been reported to me the following NMCS conditions occurred during the last two weeks:

_______Squadron: ______Aircraft NMCS for _____Regulators

_______Squadron: ______Aircraft NMCS for _____Regulators

2. I require a briefing as soon as possible as to the cause, corrective action, and firm get-well date.

S. O'BRIAN, Colonel USAF
Commander

NMCS SITUATION

Copies of this handout will be given to each Exercise Director to be completed and used on every occasion of a NMCS.

A team should recognize there are 2 Regulators per aircraft and, if they are unfortunate enough to experience a shortage of 2 Regulators on one Base during a single period, then a cannibalization policy should be implemented and only one aircraft would be grounded. There will be a cost of $500 for each cannibalization, making a NMCS cost $8,000 per aircraft instead of $15,000 for two aircraft.

PART IV - CRITIQUING

In order to increase the learning outcome of playing LOG-PLAN-X and to make the critque more meaningful, we suggest when you critique the play of your team, you highlight the following management areas of decision-making, rather than comment upon specific actions relating to specific events.

1. Stock-Level Policies

   What were they?
   Were they reviewed?
   Were they changed?
   Were they followed?

2. Management Philosophy

   Did the team have a management philosophy?
   Was it a stated philosophy and if so, was it maintained?
   Was it noticeable?

3. Budget Computations

   What methodology was used?

4. Unique Decisions

   Were there any unusual decisions?

5. Communications

   Did the team establish communications with DC/OPS and others and among themselves?

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